COAL AGE

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Some Things Night Schools Do Not Teach

If you haven't a school for your employees, start one now. If you have one, see that the instruction includes work here referred to. If you are developing a course on the line suggested, give us the details.

Night schools are great institutions for ambitious men who desire to advance in coal mining, but they should concern themselves with other subjects in addition to English, mathematics, gases and problems of ventilation.

It is necessary that the mining man be taught to assume the right attitude toward his associates, whether they work with him or for him. Patronage of night schools is the logical way for the men to receive this training.

A candidate for a mine foreman's certificate may have completed satisfactorily the entire course of theoretical instruction arranged by any large coal company, and still this man may not be competent to fill the place of foreman.

The boss, to be a good one, must inspire loyalty and secure the interest of his employees. To do this it is essential that he be in sympathy with them, that he be strict but fair in his discipline and that he give to each of the multitude of mining details its relative importance.

It is very foolish to believe that the man who has the real, genuine "stuff" in him will develop and exercise even a small portion of the necessary qualities in a hit-or-miss manner.

Why not include instruction in the essentials of management in the night-school course? They are just as vital to the making of a successful foreman as the practical knowledge of ventilation or drainage.

It's a long jump from a coal mine to a big New York department store, but the plan of the latter in operating schools of instruction for employees, who are taught proper address to use in their daily contact with a conglomerate humanity, could be copied and applied in modified form at our mines. When a few employees are encouraged to accept right ideals, the spirit will soon be caught by the rest of the organization, and contrary internal forces will no longer pull against each other.

The miner should be taught the easiest, safest and quickest way of taking out a cut, standing timber, constructing a brattice, loading a car and transporting the coal. So many men use wrong methods simply because they see their "buddy" do it, and this could be eliminated by proper instruction.

Employers should not only direct the efforts and ambitions of their employees while at work, but also after working hours. It is these idle hours and the way they are filled in that make the man.

Ideas and Suggestions

A Plea for Conservation

By Geo. N. Lantz*

We criticize our forefathers for their methods of using and misusing timber—a natural resource for the benefit of the many, rather than the few.

We say that they took from us our heritage.

We blame them for the wasteful methods which ruthlessly destroyed their timber and ours.

We feel that they had no more right to deliberately waste and destroy than a man on his deathbed has a right to give orders for the destruction of his mills and factories.

We believe that the timber owners should have agreed among themselves to name such a price for their product as would insure a fair profit on all timber—such a price as would insure the economic operation of timber lands and would prevent the destruction of the little trees while the big trees were being cut in the logging camps.

We feel that the consumer should have been willing to bear a slightly higher cost, if not for business reasons, then from patriotic motives. Our forebears contracted debts for us to pay; they should have left us the wealth with which to pay them.

We believe that the public in those bygone days should have evinced sufficient interest to see that our rights were protected.

The State Should Have Interfered

After the failure of the timber owners, the consumers and the public, we feel that the state should have so regulated the lumber business as to permit a fair profit and compel conservative operation—to admit maximum production and to insist upon the elimination of waste.

We believe we are impartial when we so criticize our ancestors.

But we can justify them, in part. Some of the lands they depleted of timber were rendered more useful for other purposes. Much of the land was needed for other purposes. The lands so depleted could again be planted in timber; and, in their ignorance, they did not realize that timber would ever be an expensive commodity—they considered the supply inexhaustible.

Likewise will our progeny criticize us for our present methods of using and misusing coal—a natural resource for the benefit of the many, rather than the few.

They will accuse us of stealing their heritage.

They will find much to criticize in our methods of mining that permit of our covering up for all time coal that belongs to us and to them.

They will place us in the same class with a man who, knowing the end of his life was near, would go out and kill his cattle and chop down his orchards.

They will know of remedies for the conditions that shaped our course.

They will say that coal operators should have coöperated to secure a fair price for their coal; such a price as would have given a fair profit; such a price as would have permitted the extraction of thick seams and thin seams and insured property against loss.

They will feel that the consumers should have been willing to pay more, for patriotic reasons, if not for business reasons. They will cite the multitude of state, county and municipal bonds we issued for them to pay and will claim justly that we should have left them the wealth we now destroy.

They will blame the public for permitting their rights to be violated.

They will say that in the absence of any action on the part of the producers, consumers or public the state should have so regulated the mining business as to permit a fair profit and to compel conservative operation—to admit maximum output and to forbid waste.

They will be justified in so criticizing us, for they will be unable to find any extenuating circumstances.

We do not add to the value of the land by extracting the coal. We can never replace the products of our mines; we know the supply is limited.

*New Straitsville, Ohio.

United We Stand, Divided We Fall

By Pennsylvania Engineer

The coal-mining industry is a house divided. With a steep and rocky path ahead, internal strife is making the going more hazardous. While operators and miners should coöperate for their mutual benefit, they are really fighting each other, and so long as operator and miner are at "loggerheads" so long will trouble be with us.

Operator must meet miner, and miner must meet operator, on a fair and square basis. The miner must sober up and work every day the mine works. He must cease being a "floater," settle down and become a man in whom the operator can place confidence. He must endeavor to load only clean coal and must mine his coal as completely as possible with safety.

Giving Full Value Received

If a day man he must do a full day's work for his pay. He must not "soldier" a couple of hours away, but must make his work count, so that at the end of the day the company has received full value for his wage. If a driver he must strive to do the best he can and with the least abuse to the animals and rolling stock. The foreman and assistants must in every way plan and execute their work in the safest and most economical manner.

On the other hand the operator must meet his men openly and frankly. The miner today unconsciously forms an antagonistic opinion of the operator owing to ignorance of the facts. Let the operator be honest and straightforward in his dealings with his employees. If the price of coal is low and the increase in wages asked for cannot be met, explain this to them as man to man.

it certainly concerns them and they should know the facts.

Provide good dwellings, and realize that there is a distinction between the men. One man is accustomed to better home surroundings than another, and in order to receive full efficiency from both men, this fact must be realized and considered. The company that can make its employees feel that it has their welfare at heart can save many unearned dollars from passing through the pay window.

While all the above seems mere "rot" when we think of the average foreign-born coal miner, yet if he could in some way be made to feel that by helping the company in this way he will help himself, his "buddy" and the whole coal-mining industry, then he would soon develop a loyal feeling toward his employer, providing his employer in turn did his part.

It is time that the operator and miner got together, for by fighting one another they are only fighting themselves, wasting their resources in a cause which does nobody any good, but saps the vitality and weakens the strength of both.

Handling Mine Supplies

By H. H. Warner*

The proper handling of repair parts and supplies at a coal mine is a subject that should receive the close attention of both the operating and office forces. Regardless of what system is installed, many leaks can occur if proper care is not taken. When the operating department fails to interest itself in the conservation of mine supplies, leaving the matter entirely to the office force, the result is that the records frequently fall behind, and it is then likely that the next inventory will show that the company has been keeping records which are of no value.

Where a stock ledger is used, it should be kept up to date, so that it will not only control the stock, but may be used as a check against purchases of material. The following is a popular system and I believe will meet all requirements:

First, take a complete inventory of all material, repair parts and supplies in stock. After the inventory has been rechecked, the total amount will be the control over these items in dollars and cents. Separate all items under the various headings which are used to govern the operation of a mine; for instance, timbers, track material, bolts and nuts, blacksmith iron, repairs for pit cars, mining-machine repairs, motor repairs, electrical supplies, construction material, etc. This will give a separate total of the amount of money tied up in parts, with such total divided into its respective departments.

Use a Separate Page for Each Item

In writing the ledger use one page for each and every item, no matter how small an amount is on hand. The ledger is indexed according to the different departments or the different classes of material used in that department. By doing this the items are located in the ledger much more conveniently and satisfactorily than when they are indexed alphabetically. When the latter plan is used, such repair parts as are employed in the operation of coal-mining machines will be scattered through the ledger from A to Z. This would make it necessary to leaf each and every page in order to locate the different items.

When the ledger is posted according to the inventory and checked to balance with the controlling amount, all invoices received are charged under the proper account in the ledger. Where freight is paid out to get such items into stock, this freight should be added to the amount of the invoice and separated among the items the invoice calls for. It is also well to remember that this amount is charged to the ledger instead of the original amount of the invoice. Such a plan is always followed except where a freight account is carried and charged off against daily operation.

Invoices are kept intact for one month and then listed on the debit side of what is known as the repair, supply and material balance sheet. When material is taken out of stock and used, the mine superintendent or mine manager must furnish the office or the supply clerk with a requisition form of such items. This requisition should have an extension column for the amount, so that when it is turned into the office the articles can be priced and the amount extended, always using the ledger as a guide in making these extensions, so that when the stock of a certain article is depleted, the ledger page on that particular item will balance. After the requisition has been extended, the stock ledger account is credited with the items and amounts shown.

Accounts Are Balanced Each Month

At the end of the month these requisitions are listed on the credit side of the balance sheet. Then by adding the last controlling figure of the previous month to the total debits of stock minus the credits, a new controlling figure will result.

The ledger invariably should be balanced every month. No debit entry should be made to the stock ledger until the material covered by the invoice has been received and placed in stock. If there is a shortage of material received from that shown on the invoice, this item should be cut off of the invoice and the balance properly charged to the ledger. Invoices should be received either in duplicate or triplicate, as this will always leave at least one copy for the stock-record file for future reference.

The system described will have to be kept up every day, especially where the items used are charged against the cost of daily operation. If it is not kept up, there will result a loose handling of the items covered in these records; and to save the records from this fate, both the office head and the operating head should see that the system is carried out as outlined and that requisitions are properly made out for all items, with proper charges and credits made after the invoices and requisitions have been received in the office. In other words, the supplies and materials should be guarded with just as much care as will be exercised in looking after an amount of cash equal to what the items represent.

*Chicago, Ill.

One Authority Says: "Eighty-five per cent. of the coal of all Canada is in the province of Alberta. Sixty per cent. of the coal in the British Empire is in Alberta. One-sixth of the coal in the entire world is in Alberta. Here is another way of considering it: Alberta, during the past 20 years, has produced about 20,000,000 tons. At that rate it would take 1,072,000 years to exhaust all her coal areas. At the rate Canada is using coal now Alberta could supply the Dominion for 100,000 years. At the rate the world is using coal, Alberta could keep up a continuous supply for the whole world for the next 100 years, and then have coal on hand."

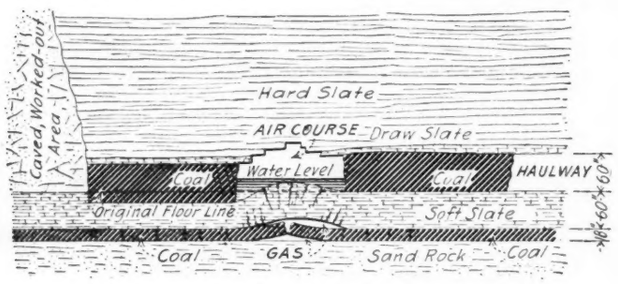
Unexpected Emission of Gas

By F. C. Cornet*

SYNOPSIS—Owing to the fracturing of a lower and unworkable seam and to the crevicing of the slate measure above it, gas is allowed to escape into a mine working which prior to that occurrence had always been entirely nongaseous. The current is reversed so that this gas may no longer be driven toward the working faces.

The accompanying sketch shows a cross-section of the mine workings skirting a large worked-out territory. The weight of the overlying strata has forced down a narrow pillar of coal into the soft slate pavement. This pillar for nearly half a mile separates the worked-out area from an important air course, which serves to ventilate distant workings where a number of men are employed. The air course is also a drain for the abundant waters that find their way from the surface into the mine through the worked-out territory.

Although the pillar to the left of the air course has sunk nearly two feet into a soft bottom, the pillar on the opposite side has not yet been appreciably driven down-



CROSS-SECTION OF MINE WORKINGS

ward. There is no doubt, however, in my mind that this pillar is slowly sinking and would have sunk deeper before this had it not been that the water from the worked-out area was intercepted by the air course and so diverted to the outside. No doubt some of the water finds its way toward the place designated as "haulway," seeping there through the soft slate pavement, softening the latter and thus making it give way slowly but surely under the weight of the 1,400 ft. of hill bearing upon it.

As shown by the sketch, when the pillar on the left sank into the soft bottom, rendered still softer by water, it compressed this bottom so that some of it was squeezed outward. As there was no empty space to the left, it is not likely that much if any of the slate forced out went in that direction. But there is ample evidence that much of it was driven into the air course, causing the pavement to heave until only one-half of the original headroom was left.

Lower Seam Is Broken by Floor Stresses

Under the soft slate that constitutes the pavement of this seam, another seam of coal is always found the thickness of which varies from a few inches to several feet. The thickness of the intervening slate runs from 2 to 80 ft. At the particular point shown by the sketch, this slate was found to be 5 ft. thick and the lower seam of coal to measure 18 in.

The lower seam rests, without adhering to it, on the highly polished surface of the hardest kind of sandstone. Its unusual smoothness indicates that in remote geologic times there must have been much friction caused by the coal sliding on the sandrock or the sandrock moving under the coal.

The lower seam does not adhere much to the overlying soft slate, but the contact surface between the two is uneven and rough enough to make it likely that when the 5 ft. of soft slate was squeezed out toward the air course there was a tendency on the part of the lower seam to go with it at least part of the way, especially as such a displacement was facilitated by the smooth and polished condition of the surface of the sandrock lying underneath.

It is not hard to imagine that in the lateral displacement of both the soft slate and the lower seam such conditions might be caused as shown by the sketch, in which the soft slate not only has heaved into the air course above, but has also separated itself from the coal underneath after displacing it and causing fissures to appear in it running in all directions. The lower seam might also have been raised partially above the sandstone. Cavities would thus be formed as shown, partly filled with débris of slate and coal, but open enough to afford easy intercommunication between all the cracks and fissures mentioned.

The heaving of the floor of the air course could not well occur without some cracks appearing in the slate of which the floor is constituted. One or more of these cracks reaching through the 5 ft. of slate would suffice to maintain a free outlet into the air course for any gas liberated by the lower seam.

No Gas Till the Lower Seam Was Fractured

The mine where this condition obtains is quite large. It is in one of the seams of the New River series. Operations had been prosecuted in it for several years and had reached far into the hills. Notwithstanding the most watchful vigilance, no gas had ever been detected in the workings. In a way more or less vague the authorities knew of what has been designated here as the "lower seam," but they never gave it more than a passing thought. They were far from expecting trouble from its presence.

But one morning a year ago a man had his hair and eyebrows singed, besides being badly scared. He set fire to a small body of gas near the roof in a place where nothing but fresh air coming direct from the fan was supposed to travel. During the next ten days four more inflammations took place, none of them serious. All were under like conditions and on a split of air between the fan and the first working places. No air reaching the spots where the accidents occurred could possibly have swept any coal except such as had been exposed to a ventilating current for at least two or three years.

No gas had ever been found at the faces. But any gas they might have found there could not by any means have been made to travel toward the fan against the

*Mining engineer and geologist, Charleston, W. Va.

air. After the first inflammation, the officials proposed making an inspection of the airways by traveling against the current from the spots where the accidents had happened, but they soon ran into some water 2 ft. deep and the inspection stopped there.

After four more explosions had occurred, a pair of rubber boots was telephoned for, and a man carrying a safety lamp was sent through the water. He did not see anything, but soon heard gas bubbling through the water and hastened to report his discovery to the foreman, who immediately understood how the mysterious accidents had occurred. A thorough investigation was made, and the sketch incorporated in this paper was prepared. The ventilation was reversed so that the fan drew the air to the mine mouth instead of driving it toward the working faces.

Though a year has passed since that time the gas from the lower seam is still passing through the cracks in the pavement and bubbling through the water in large quantity, which tends to show that when the soft slate was squeezed out from under the narrow air-course pillar, it must have disturbed and creviced a large area of the lower seam, or such a large amount of gas would not have been liberated.

Extracts from a Superintendent's Diary

Occasionally an intelligent, conscientious, hard-working employee labors on year after year without winning promotion, simply because no vacancies occur in the ranks above him. For such a man there is not a line of sympathetic advice in the whole range of literature, or if there is I have not been able to find it.

Last week one of our mining engineers tried to commit suicide, and because of the contents of a note that he prepared, thinking that it would not be read until after his death, I became interested in the subject of giving advice, especially to men who might consider themselves failures, judged by present standards, and I have read everything that seemed to bear on the subject.

It is surprising to note how all of the present-day writers on the subject of getting ahead in the world emphasize the fact that there are not enough "hundred-thousand-dollar-per-year" men to go around, and the natural conclusion to be drawn is that anyone who has the proper stuff under his cranium cannot fail to climb into the hundred-thousand-dollar class in short order.

In fact, that is exactly the conclusion our mining engineer came to some time ago, and because he did not succeed in getting advancement in spite of earnest effort, he became morose and discouraged, and finally reached a stage where he considered himself a rank failure and decided that he would be justified in ending his life.

Since his partial recovery, I have had several long talks with him and have obtained an insight into the effect that too much rose-colored exhortation may have on average men who are already making desperate efforts to reach heights which are not beyond their reach unless they become impatient.

And profiting by the insight given me, I have been able to recall some of my associates of past years and to account for many of the queer actions that characterized their last years on earth. It is all so clear now—the warning that was withheld from them, the realization of which would have carried them smiling across the long stretches of discouragement. The vision is so clear to my mind and has made such an impression upon me that I in turn have been able to interest the despondent man, and he has become eager to try his luck again.

But if I were compelled to write out a few suggestions for the guidance and encouragement of young men, I feel sure that I, too, would find myself quickly running to rosy themes.

To suggest to ambitious men that it would not be possible or desirable for all climbers to climb to the same heights seems like throwing cold water on a fire that one is trying to kindle.

It's all very well to say that most of the pleasure of living is derived from anticipation—in fact, there are plenty of men who have already said that—but how can one convey to a struggling soul the idea that anticipation may joyously be spread over a long series of years and even be carried triumphantly into the grave without having been turned into realization?

After all, in spite of the tons of literature that are being printed every year, it seems that there are some truths that have not been given to the world yet—at least not in terms that are intelligible to all of us; and that probably accounts for much of the literary effort still being put forth.

Anthracite Coal Shipments Far Behind Last Year

Total shipments of anthracite coal for the first nine months of this year, as compiled by the Anthracite Bureau of Information, were 2,688,470 tons less than for the first nine months of 1914. Shipments of anthracite for September were 5,518,771 tons, as against 6,246,192 tons in September, 1914, a decrease of 727,421 tons. The amount of coal on hand at tidewater shipping ports decreased 20,158 tons, from 653,496 tons on Aug. 31 to 633,338 tons on Sept 30.

This shortage of over 2,500,000 tons as compared with last year is partly owing to a decrease in consumption on account of the mild weather last winter and partly to the fact, reported by sales agencies and dealers, that domestic consumers have postponed buying their winter supply till the last minute.

The Lehigh Valley led in tonnage for the month, with 1,093,283 tons; the Philadelphia & Reading was second, with 895,718 tons; and the Lackawanna was third, with 820,440 tons. The Delaware & Hudson carried 737,592 tons, the Erie 718,751 tons, the Jersey Central 626,237 tons, the Pennsylvania 467,587 tons and the New York, Ontario & Western 159,163 tons.

Responsibility for Defective Equipment—A coal operator is not liable for injury to an employee resulting from absence of a bumper on a tram car, it having been broken off, unless the defect had existed long enough to have afforded the operator opportunity to discover and remedy it, in the exercise of a reasonable degree of care for the safety of his employees. (Alabama Court of Appeals, Westbrook vs. Sloss-Sheffield Steel and Iron Co., 69 Southern Reporter, 311.)

The Southern Appalachian Coal Operators' Association held its third quarterly meeting at the Cumberland Hotel, Middlesboro, Ky., Friday, Oct. 22, at 7:30 p.m. Reports from the chairmen of the several committees were read, and a paper on "Cost Keeping," by G. M. Shoemaker, of La Follette, was presented. The meeting was an open one, nonmembers being invited.

Making Fuel Out of Garbage

By W. D. Hornaday*

SYNOPSIS—All the city garbage of San Antonio, Tex., that can be burned is made into briquettes and sold for $6.50 per ton. Shoes, hats, paper, rags, manure, etc., are all included in the raw product from which the fuel bricks are made.

Manufacturing a high-grade fuel from garbage is a new industry that promises to solve the problem of disposing of the waste of towns and cities. In October of last year the first experimental plant of a new garbage-disposal process was established in San Antonio, Tex. It has proved so successful that a large plant is to be erected in Austin, Tex., by E. L. Culver, who is the inventor of the new process, and his associates. They have entered into a contract with the city by which they receive 25c. a ton for all the waste delivered at the plant. This is about 50c. per ton less than it now costs the city to dispose of its garbage.

FUEL-BRICK PLANT AT SAN ANTONIO, TEX.

FUEL BRICKS MADE FROM GARBAGE

The important feature of the new method of handling the waste that comes from the streets and alleys is that it is converted into a fuel that is said to be equal to bituminous coal. Mr. Culver began investigating the possibility and practicability of commercializing municipal garbage about five years ago. As a result of a long series of experiments he proved the adaptability of a method for making fuel bricks out of the refuse. This is accomplished in much the same manner that stiff mud-bricks are made. He employs practically the same machinery that is used in making cut mud-bricks. There is this difference in the process, however—the fuel bricks are not required to be as smooth and perfect as building bricks. The fuel bricks are dried in the sun or open air instead of in kilns. To produce this new fuel from garbage a mixture of equal quantities of coal dust and garbage, with an addition of 7 per cent. of water tar from gas plants or oil refineries, is used.

It takes one thousand of the fuel bricks to make a ton. They are clean and dustless and are easy and convenient to handle. In San Antonio the new fuel is being used by many people in their homes. The demand for it is said to be much greater than the supply. Its advantages are as follows: It will not slack, no matter how long it is kept in storage; it is impervious to water and burns to ashes without leaving a semblance of clinkers; and it produces no odor and little smoke when being burned. Dr. William B. Phillips, who recently experimented with the fuel bricks by burning a number of them in an open grate at his home, reports the following results:

"The briquettes had no disagreeable odor whatsoever, smelling faintly of tar; they were easy to handle, cleanly, easy to fire, gave no excess of smoke over ordinary bituminous coal, did not clinker and did not give any trouble at all in the grate. These briquettes were entirely consumed and preserved their rectangular shape, even when in the form of ashes. I was pleased with the results of burning the briquettes and would use them regularly if they could be supplied at a price comparable with that which we pay for bituminous coal in Texas—generally $8.50 per ton."

Old Shoes, Hats, Etc., Made into Briquettes

The remarkable spectacle of seeing old shoes, hats, paper, rags, straw, manure, house garbage, night soil and a variety of other waste products being thrown into one machine and emerging from another in the shape of a perfect fuel brick is to be witnessed daily at the plant in operation at San Antonio. The finished product bears no resemblance to the raw materials that enter into its manufacture. The process performs the important work of sanitation, which is considered of the utmost importance in disposing of municipal garbage. In San Antonio the experimental plant is to be enlarged so as to handle the garbage of the entire city, a contract to this effect having just been entered into by the municipal authorities and the fuel company. The City Commission of Austin, after a thorough investigation, decided to abandon its garbage incinerator and adopt the new process.

F. M. Gunn, of the Massachusetts Institute of Technology, who recently delivered a series of lectures on sanitation and garbage disposal at the University of Texas,

*Austin, Tex.

expressed the opinion that the process which Mr. Culver invented is one of the most promising schemes so far advanced for handling city refuse.

"It certainly appears to me that this is the best way of getting rid of waste and rubbish in a sanitary manner," he said, "and it may be that this method will work a new epoch in the garbage problems of the country."

In discussing the sanitary phase of the new method of handling the rubbish of towns and cities, Mr. Culver said:

"The importance of the proper disposal of waste matter in cities and towns has been recognized by health authorities and sanitary engineers everywhere, and for a few years past has been receiving the most careful and serious attention as one of the really urgent questions relating to the development of the modern city. Interest in matters

OLD DUMP METHOD OF DISPOSING OF GARBAGE

affecting the public health is more widely manifested now than ever before, especially with regard to the spread of disease known to be infectious and contagious. Garbage and refuse of all kinds, if not properly taken care of, become an immediate menace to the health of the community, besides furnishing a fertile soil for the production of all manner of disease germs.

The Danger of Garbage Piles

"Garbage is also the breeding place of flies and other disease-carrying insects. The removal of waste, while protecting the city, merely carries the danger somewhere else; and the problem may be passed on, but it is not solved by the practice followed in so many cities of dumping into the rivers, streams and lakes of the country all the sewerage and the larger part of the garbage. Instead of being eliminated, the peril to the public health is greatly increased, the risk of diseases is spread over a still larger area, the air is polluted by foul odors and all the natural beauties are destroyed by such abuse.

"A satisfactory solution of the problem of sanitary disposal of the waste of cities has been difficult indeed, and the various methods adopted have been largely makeshifts of doubtful value. The method of incineration has been perhaps the best, and yet the process is open to serious objections, because the fumes from the incinerator are neither deodorized nor disinfected. So from a sanitary standpoint there is not enough accomplished to justify the large initial cost of erecting these incinerating plants with their additional heavy annual expense of maintenance, which is so great that most cities are now discarding them and using the old dumping ground."

The mechanical arrangement of the garbage-fuel plant is simple. The refuse is unloaded from wagons upon a sorting platform and then sprayed with creosote, not only as a sanitary precaution, but to allow the sorters to work with comfort. Through holes in the platform the garbage is dropped onto conveyors, which carry it to the various departments of the plant. The iron is carried into storage bins; dead animals are conveyed to the fertilizer department; bottles to the washing tank; ashes, stone and brick to a dump; tin cans to an incinerator, which removes the solder, the remaining tin pieces being baled; and the residue of the garbage is conveyed to the fuel-manufacturing department where it is made into bricks.

The entire plant is tightly inclosed so as to keep dust from escaping. The cost of manufacturing the fuel bricks is about $1.80 per ton. They sell in San Antonio for $6.50 per ton.

Stocking Operations of the Western Railroads

Numerous rumors have been current as to plans of the different Western railroads for storing coal in anticipation of a cessation of work at the mines pending wage negotiations next spring, and an investigation develops that there is some activity in this direction.

The C., B. & Q. R.R. has arranged to store 200,000 tons at its principal coaling stations. The work was commenced several weeks ago, and that road has already approximately 190,000 tons unloaded on the ground.

While the Illinois Central R.R. has not yet commenced to stock up, it is considering the question of putting a 40 days' supply in storage, concentrating the coal at two or three central points, where there will be a regular organization for reloading, including Brownhoists, clamshells, etc.

The New York Central Lines contemplate storing a 60 days' supply on their Western lines and have already commenced unloading the coal on the ground. The Michigan Central may commence stocking at any time at its principal terminals.

The Rock Island Lines contemplate the storage of approximately 300,000 tons, or nearly a 40 days' supply, to be placed at convenient terminals. The unloading of this coal on the ground will begin immediately.

No immediate action is contemplated by such roads as the Northwestern, St. Paul, Alton, C. & E. I. and C., G. W. R.R., and it is thought that they will not commence to store coal on the ground until late in the winter, probably two or three months before the mines are shut down.

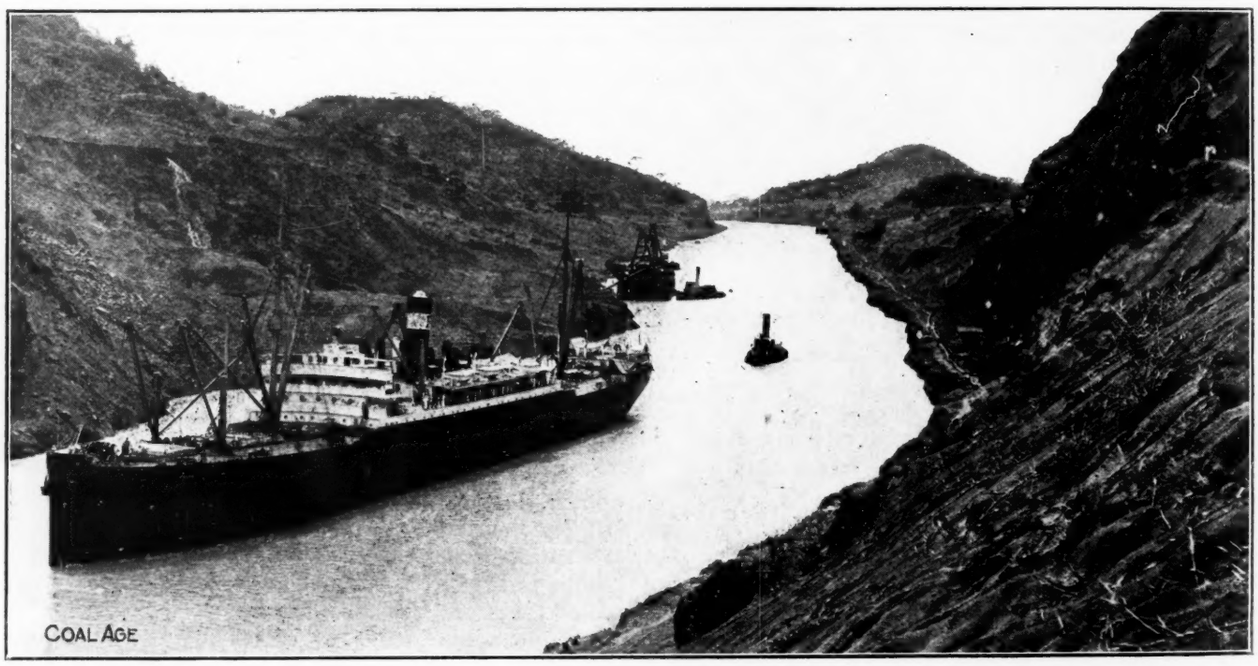
With the view of utilizing the least equipment in moving the coal, most carriers are attempting to place their storage piles at points nearest to the mines furnishing the coal. The usual method is to pile the coal on dry and well-drained locations if trestles 10 or 12 ft. high cannot be built from second-hand timbers. Tracks are not built on the coal piles for unloading or reloading, and almost always clamshells or mechanical devices are used in handling the coal. Coal is not piled to exceed 10 ft. high and 25 ft. wide at the base. Frequent openings are allowed, about 50 ft. apart, halfway down to the ground, to permit easy separation of coal which may catch fire. Every effort is made to assist the admission of air to the interior of storage piles through passages formed by timbers, piers, brickwork or other objects projecting into the coal.

Coal Shipments Through the Panama Canal

By James Steelman*

SYNOPSIS—The amount of coal passing through the Panama Canal is increasing. The most of this fuel is of American origin. It is by no means certain that the prices charged for bunker coal at the canal cover the real cost. The specifications on this fuel are such that only about the best steam coal in the country can meet them.

The Panama Canal was formally opened for business upon Aug. 15, 1914, so that by Oct. 15 an experience of two months had accrued. Leaving aside the passage of noncommercial vessels, the canal in this period witnessed the transportation through it of 583,949 tons of cargo, or an average of about 9,500 tons per day. The semi-official statement was made, in reference to the business done by the canal for the first month and a half, to the effect that expectations had been exceeded. This seems promising, especially when we take into account that the great European War had been raging all the time.



S.S. "ANCON" PASSING THE CUCARACHA SLIDE WHEN CANAL WAS FIRST OPENED

One-half of all the business done during the first two months related to shipments between the east and west coasts of the United States, the Hawaiian Islands being reckoned in with the Pacific Coast. In respect to the character of the shipments, the general statement may be made that the cargoes passing from east to west were manufactured goods; and the cargoes passing from west to east consisted chiefly of canned goods (fruits, vegetables, salmon), lumber, grain, sugar and pineapples.

The number of passages of ships engaged in American business totaled distinctly less than 50 per cent. of all passages, while the American cargo tonnage was almost exactly 50 per cent. of the total. This shows that the domestic business was carried in vessels of a size greater than the average of those using the canal.

The trade route disclosed as next in importance is that between eastern United States and western South America. Along this route 19 per cent. of the traffic passed, so that this business, while second to our domestic interchange, was not yet a good second. Of the 19 per cent., five-sixths was northbound. This corroborates the indications perceivable before the opening. We buy from western South America, but we do not sell to any extent.

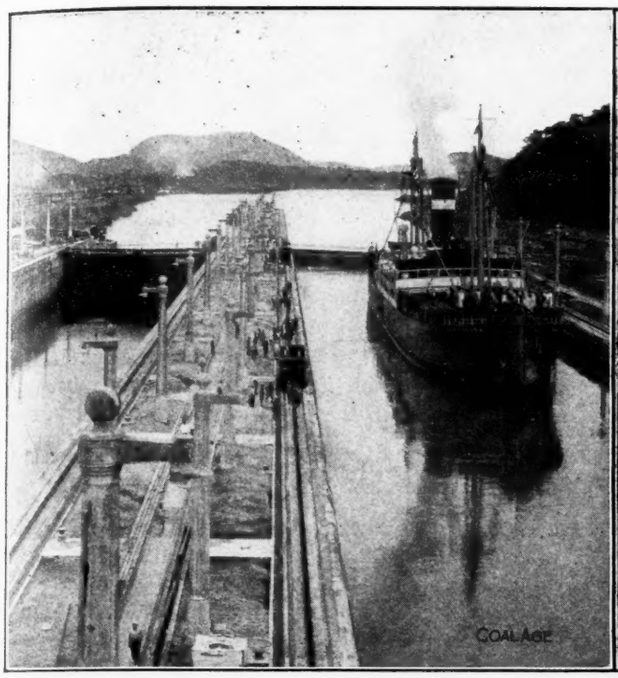
The third route in point of importance, as disclosed by the record, witnessed shipments having a total percentage of 13 out of the grand aggregate of all canal business. This route connects the Pacific Coast and Europe. Nearly the whole of these shipments went in one direction and consisted of grain. Manufactured goods from Belgium constituted 1 per cent. out of the 13.

The fourth route connects eastern United States with China and Japan. The business on it constituted 9 per cent. of the grand total of all traffic through the canal. The whole of this Far Eastern business went in one direction—from the Gulf of Mexico, Philadelphia and New York—and consisted of petroleum products.

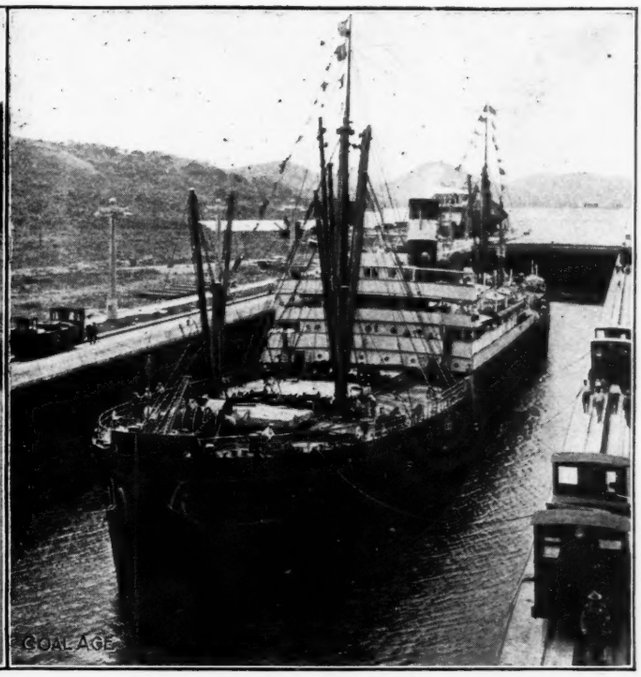
Coal and Coke Shipments

An important development has concerned coal shipments to ports other than those at the termini of the canal itself. There were no shipments at all until Sept. 19, 1914—over a month subsequent to the canal opening. Between Sept. 19 and Oct. 3 inclusive, 34,545 tons of

*No. 618 West 136th St., New York City.



S.S. "SANTA CLARA" ON ITS WAY THROUGH CANAL



S.S. "ANCON" IN UPPER LOCKS AT MIRAFLORES

coal passed through the canal, nearly all of it bound for western ports of North America. The remainder (6,010 tons) went to Valparaiso. It will be seen that the coal business was responsible for 6 per cent. of all business done by the canal in the first two months.

From the commercial opening of the canal to Aug. 1, 1915—nearly one year of operation, all of the period within wartime—56½ cargoes of coal and 8½ cargoes of coke have gone westward through the waterway. Coal, however, did not begin to pass through until Sept. 19. Within the 46 succeeding weeks, the coal and coke cargoes have averaged 1.41 shipments per week. But this does not give a correct view of what is now going on.

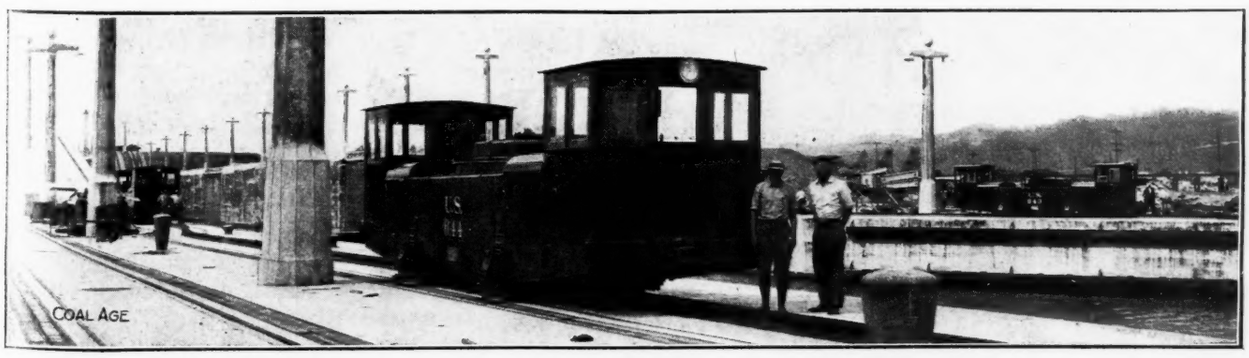
Prior to May 24, 1915, there were weeks, many of them, showing no cargo shipment of coal or coke. But since that date, no single week up to Aug. 1 (the final date of the record at the time of writing) passed without such a shipment. There were in all during this period 24½ cargoes of coal and 7½ of coke, all going west. The average for these 10 weeks was accordingly 3.20 cargoes per week. This is more than double the weekly average for the whole 46 weeks. Apparently coal shipments through the canal are decidedly upon the increase.

It will be of interest to note whence and whither the coal and the coke are going. I begin with the 7½ coke shipments. There were three of these from Baltimore—two went to Coquimbo, one to Antofagasta. Two and one-half cargoes went from Norfolk—one to Cruz Grande, one to Valparaiso and the half cargo to Callao. Of the remaining two shipments, one was from Leith, England, to San Francisco and the other from Barry to Santa Rosalia. So much for the coke.

Of the 24½ coal shipments, 15½ went out from Hampton Roads. Five of these were destined for San Francisco and three for San Diego. Four shipments went to Tiburon. The remaining three and one-half were distributed to Manila, Valparaiso and Callao. Three shipments originated at Baltimore—two for San Francisco and one for Seattle. Philadelphia was responsible for just two cargoes—one for San Francisco and one for Bremerton. There remain four cargoes to be accounted for. One was a shipment from Cardiff to Balboa, one from Guantanamo to Gatun Lake and two from Kingston to the Pacific Ocean. These last two cargoes were doubtless destined for the use of the British navy.

Origin of Coal and Coke Shipments

It is of interest to note that the foregoing shipments represent, for the most part, business originating in the United States. Five and one-half out of 7½ coke cargoes

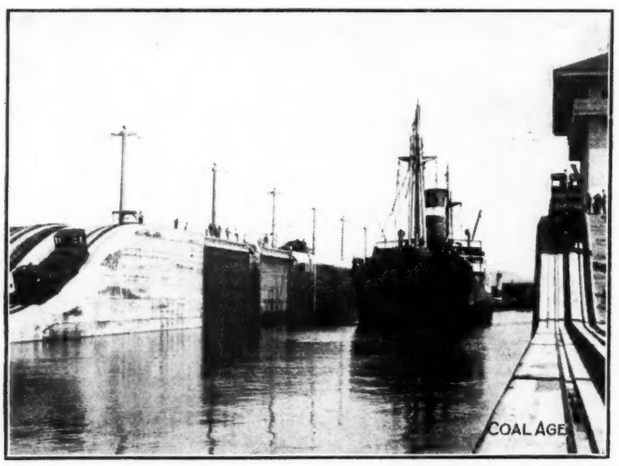


A TOWING LOCOMOTIVE AT GATUN LOCKS READY TO MAKE FAST TO A VESSEL

went from Baltimore and Hampton Roads. Twenty and one-half of the 24½ coal shipments originated at Hampton Roads, Baltimore and Philadelphia. This preponderance of American shipments is due largely no doubt to the occupation of Great Britain and Germany with the war.

The destinations of the coke were mostly foreign points, only one shipment being for the Pacific Coast. Of the coal shipments, eight were for San Francisco, three for San Diego, one for Seattle, one for Gatun Lake, one for Balboa and one for Manila. The Balboa shipment may possibly not have had this point as its final destination. Counting it, however, we have 15 cargoes out of 24½ for the United States and possessions.

Apparently the canal business is moving along in good shape, notwithstanding the war, the coal industry being responsible for its share. There is, however, still another angle from which we may view coal and the Panama



STEAMER BEING TOWED BY ELECTRIC LOCOMOTIVE ON EACH SIDE

Canal. A considerable percentage of the ships passing through naturally require bunker coal somewhere on the voyage. Some will get their fuel at Hampton Roads, others perhaps at other points; but a large proportion will undoubtedly bunker at the canal itself. The Government is providing large facilities for this business, which will be at the disposal of all those requiring coal. Further, the two great storage yards and mechanical equipment which are to go into commission shortly will be at the service of private parties and concerns which wish to participate in the sale of bunker coal upon terms of a reasonable character. At present coal for bunker purposes may be obtained either at Cristobal or Balboa; that is, either at the Atlantic or at the Pacific terminus. At Cristobal coal is being sold at $5.15 and $5.40 per ton, the second price being for fuel trimmed in the bunkers. The cheaper price may be obtained by taking coal in from railroad cars alongside the wharf by the use of the ship's own gear. A steam hoist and crane may be utilized, but a charge of $1 per hr. is made for the use of the apparatus. Lighters are ordinarily used when coal is delivered and trimmed for the higher price.

At Balboa, the prices are $6.40 and $6.15; but no handling apparatus is now available at this point. The foregoing prices are those established by the Panama R.R. It is recognized that a flat rate for all comers is inequitable. Some ships have bunkers easy to reach and easy to fill and trim; others have bunkers which present great difficulties; there will also be intermediates.

Furthermore, it is quite possible that the railroad feels that its short experience has resulted perhaps in a loss on the trimming, even on the average. The railroad was paying $2.70 for coal at Hampton Roads. The freight cost to the canal was $1.395. So that before the cost of storage and handling was added, the coal cost $4.095 at the Atlantic terminus. Some profit was naturally desired. The $1 excess in the price of coal at Balboa was due solely to the canal tolls and not in any degree to the additional transportation. Whether this $1 really covered the tolls seems to be in doubt. There is uncertainty on this fundamental matter because of the difference between practice and theory in the effect of the measurements of vessels.

Canal Charge per Ton Varies with Vessel

Commercial vessels going through the canal pay $1.20 for each displacement ton of available cargo space, if the vessel carries any cargo whatever; and $0.72 for each displacement ton, if the vessel is in ballast. A collier going from Norfolk to Balboa and returning empty will be subject to both tolls, so that the coal will have to pay the total.

A displacement ton is 100 cu.ft. of space—that is, of cargo space. This may sound very simple; but in practice the determination of what is and what is not cargo space is not only difficult, but practice differs. Until a vessel has been actually measured under the rules of the Panama Canal it is ordinarily impossible to tell what the tolls will be. Measurement by other rules affords rather an uncertain guide. Probably the closest approximation to the Panama rules are those in force for the Suez Canal. The relation between the actual carrying capacity of a Norwegian tramp and its toll charges will be quite different from the relation between the same items for an American-built vessel.

Theoretically one could allow 43 cu.ft. for 1 ton of coal, and so expect to pay 43 per cent. of the round-trip toll charge of $1.92 per displacement ton. This would indicate that one ton of coal would have to bear a toll charge of $0.826. But the Panama R.R. was not clear that $1 covered it.

The uncertainty as to the relation between Panama Canal measurements and actual coal-cargo capacity is important enough to warrant the consideration of some actual examples. In making comparisons, I assume that the cargo actually on board when a ship makes the passage of the canal is approximately her real capacity. It seems reasonable to assume that shippers are going to put on board all they can.

At the end of September 1914, the "Vimeria," American registry, passed through the canal on her way from Norfolk to San Francisco with 8,340 tons of coal. The net Panama Canal tonnage was 4,754. That is to say, the amount of coal on board should have been 475,400 divided by 43, or 11,058 tons. The amount of coal capacity should have been about 2.3 times the net canal tonnage, whereas it was actually only 1.8 times this figure.

Take another case: At the beginning of October, 1914, the American-registered vessel "Neches" from Baltimore passed through for San Diego with a cargo of 6,000 tons of coal. The net canal tonnage was 4,113, so that her

cargo was really only 1.5 times her rating instead of 2.3 times. We might expect some discrepancy, but a comparison of the two examples will show that there is probably no fixed ratio between net canal tonnage and cargo capacity.

Consider a ship flying the British flag: Close following the "Neches" came the "Bankdale," British registered, with 5,943 tons. She sailed from Norfolk for Guaymas, Mexico. Her net canal tonnage was 3,637, so that she carried 1.6 times her canal rating. This is better than one of the American vessels and worse than the other.

Take another British case: "The Crown of Toledo" sailed out of Glasgow for San Francisco laden with 6,499 tons of coal, presumably British coal. Her passage through the canal was made about Oct. 19, 1914. Her canal tonnage was found to be 5,438. This makes her cargo only 1.2 times her canal rating.

Another case where the ratio is very low was furnished by the Peruvian vessel "Uruhamba," which made the passage in November, carrying 2,000 tons of coal from Cardiff for Mollendo. Her canal rating is 3,168—actually more than the cargo capacity as that capacity is to be judged by this cargo. The ratio is 0.63, which is not within gunshot of 2.3.

The fuel now being supplied for bunkering comes from the coal region in and around New River; that is, from southwestern Virginia and the neighboring district of West Virginia. The Panama R.R. has already contracted for some half million tons of this coal. The specifications are as follows:

Moisture, delivered coal, not more than	3%
Ash, dry coal, not more than	7%
Volatile matter, dry coal, not more than	21%
Sulphur, dry coal, not more than	1¼%
Fixed carbon, not less than	70%
British thermal units per pound, dry coal, not less than	14,700

Coal will be accepted where the thermal content per pound is as low as 14,400, but at a discount of ¼c. for each 25 B.t.u. or fraction thereof which may be lacking. The railroad may reject coal falling below 14,400 B.t.u. or accept it with an additional discount of double the former for the deficiency below 14,400. If the coal analyzes (the Bureau of Mines being the judge) less than 14,300 B.t.u., on a dry basis, and the railroad is compelled to accept the shipment because of its departure for the canal before receipt of the analysis, an additional penalty of 10 per cent. on the contract price is to be imposed.

The penalties indicated have in view the delivery of coal fully up to the desired thermal content of 14,700 B.t.u. In short, the railroad wants about the best steam fuel that can be supplied in quantity by American mines. The result will be a worldwide introduction of our premier grade of steam coal.

Drag Car for the Man Trip

By Ralph W. Mayer*

SYNOPSIS—If safety drags are applied to one or more ordinary cars composing a trip, they will probably stop the trip in case of accident, but will probably also derail the cars. To prevent this a special car, properly weighted, may be equipped with drags which are easily raised or lowered.

The Northwestern Improvement Co.'s Mine No. 6, of which Peter Bagley is superintendent, has installed a drag car instead of the drag usually placed on the last car of the man trip. While the ordinary drag would stop the trip if the rope or coupling broke, it usually would result in the derailment of several cars and the possible injury of some of the men upon them.

The use of the drag car eliminates this, and the cars stay on the rails. An ordinary mine car upon which four drags are placed is used. The drags can be made from pieces of light steel rails, pointed on the trailing ends. They are hung from the car axle by means of clevises or pieces of strap iron, bolted or riveted to the drag after passing around the car axle.

Two drags are placed on each axle, next to the car wheels, so that they will touch the ground near each rail, on the inside of the track. The drags in each pair are connected by means of two ¼-in. iron rods, one near each end of the drags.

Eye-bolts are secured in the drags and the connecting rods fastened thereto by means of eyes or rings on their ends. This allows freedom of movement between the various members and permits each drag to move up and down independently of its mate, but restrains its sidewise movement.

Near the middle of each drag a hole is drilled and a chain connected by means of a clevis and bolt. A hole, 2 in. in diameter, is bored in the bottom of the car, directly over this clevis, sufficiently large for the chain to pass through without binding or catching.

A 6-in. iron pipe, reaching about 8 in. above the top of the car, is securely fastened to the car bottom, with this hole in its center. This pipe may be fastened by means of angle-irons and bolts or by heating the end of the pipe and splitting it, bending the split pieces out at right angles and bolting them to the car bottom.

A 2-in. pipe is set directly over the hole in the car bottom and inside the 6-in. pipe. It is securely held in position by wooden wedges driven between it and the 6-in. pipe, care being taken to center it over the hole in the car bottom. The 2-in. pipe should be shorter than the 6-in., the difference in their lengths being about equal to the height of the car bottom from the tops of the ties or roadbed.

The chain from the drag is led up through these pipes, and a 4-in. ring is fastened to its end. When the drag is touching the ground, this ring is inside the 6-in. pipe and resting on the end of the 2-in. pipe, which prevents it from getting out of reach and keeps the end of the chain inside the car.

A slot is cut in the top of the 6-in. pipe, sufficiently wide and deep to accommodate a chain link edgewise. This slot is placed in the side of the pipe next to the side of the car, for convenience in handling the chain.

*Roslyn, Wash.

When it is desired to raise the drags for descending the incline, the chain is lifted out of the 6-in. pipe and pulled taut, raising its drag against the car bottom. A link of the chain is then dropped edgewise into the slot on the end of the pipe. The next link of the chain, being sidewise, is too wide to pull through the slot, and the drag is held up in a position well off the ground.

When the bottom of the slope or incline has been reached and it is desired again to bring the drags into action, it is only necessary to raise the chain out of the slot and let it drop inside the 6-in. pipe.

The car is filled with scrap iron and sand to give it the necessary weight, while it is covered over with 1-in. boards nailed flush with the top of the car. Its appearance will be much improved if it is painted and "Safety First" is stenciled upon the sides and top. The moral effect which such a car has on the men is worth considering, although the saving in time over the old method and the increased safety that results make its adoption worth while.

A low reel is placed on the front end of the car to hold the ½-in. cable which passes around the trip when hauling men. This cable, which is provided with a hook on each end, is carried forward on each side of the man trip, and the hooks are attached to a link of the chain on the end of the haulage rope.

This light cable passes around all the cars, and should a coupling break it would prevent a runaway. The cable should be short enough to fit snugly to the cars, yet not take any of the pull off the couplings, so that if the latter should break, the cars would not acquire any appreciable momentum before being caught by the cable.

This cable is held off the ground by means of hooks made from ¼-in. round iron. These are formed like an elongated letter G, the top end being slipped over the side of the car and the cable laid in the lower end or hook. Two hooks to the car, one on each side, are usually sufficient.

These hooks are kept in a box on the drag car when not in use. After the men have all been hoisted or lowered, the cable is reeled up, the hooks are placed in the box, and the car is side-tracked ready for use when again needed.

Record of Coke Works in Connellsville Region

The following tables, which constitute a complete directory of the coke manufacturers of the Connellsville region, were compiled by *The Courier* of Connellsville, Penn., and have been revised and corrected to June 1, 1915.

CONNELLSVILLE REGION

No. Ovens	Name of Works	Names of Operators, Address and Nearest R.R. Station
200	Acme	W. J. Rainey, New York, N. Y., Mt. Pleasant, P. R. R.
80	Acme	Penn Coke Co., Uniontown, Pa., Smithfield, B. & O.
290	Adelaide	H. C. Frick Coke Co., Pittsburg, Pa., Adelaide, P. & L. E.
356	Alverton	H. C. Frick Coke Co., Pittsburg, Pa., Alverton, P. R. R.
397	Baggaley	H. C. Frick Coke Co., Pittsburg, Pa., Baggaley, P. R. R.
182	Beatty	Mt. Pleasant Coke Co., Greensburg, Pa., Beatty, P. R. R.
300	Bitner	H. C. Frick Coke Co., Pittsburg, Pa., Bitner, B. & O.-P. R.R.
120	Boyer	Mt. Pleasant Coke Co., Greensburg, Pa., Udell, P. R.R.
240	Brinkerton	H. C. Frick Coke Co., Pittsburg, Pa., Brinkerton, P. R.R.
250	Buckeye	H. C. Frick Coke Co., Pittsburg, Pa., Star, P. R.R.-Pershing, B. & O.
30	Brush Run	Brush Run Coal & Coke Co., Mt. Pleasant, Pa., Mt. Pleasant, P. R.R.-B. & O.
260	Calumet	H. C. Frick Coke Co., Pittsburg, Pa., Calumet, P. R.R.
32	Carolyn	Peerless-Connellsville Coke Co., Uniontown, Pa., Alverton, P. R.R.
301	Central	H. C. Frick Coke Co., Pittsburg, Pa., Tarr, P. R.R.
150	Clare	Clare Coke Co., Greensburg, Pa., Trauger, P. R.R.
67	Coalbrook	H. C. Frick Coke Co., Pittsburg, Pa., Ruth, P. R.R.
400	Collier	H. C. Frick Coke Co., Pittsburg, Pa., Collier, B. & O.
400	Continental No. 1	H. C. Frick Coke Co., Pittsburg, Pa., Uniontown, P. R.R.-B. & O.
326	Continental No. 2	H. C. Frick Coke Co., Pittsburg, Pa., Walnut Hill, P. R.R.
300	Continental No. 3	H. C. Frick Coke Co., Pittsburg, Pa., Newcomer, P. R. R.
120	Crossland	H. C. Frick Coke Co., Pittsburg, Pa., Crossland, B. & O.
333	Davidson	H. C. Frick Coke Co., Pittsburg, Pa., Davidson, P. R.R.-Connellsville, B. & O.
40	Dexter	Connellsville Coke Co., Connellsville, Pa., West Overton, B. & O.
230	Dorothy	H. C. Frick Coke Co., Pittsburg, Pa., Latrobe, P. R.R.
40	Ellen No. 1	Whyel Coke Co., Uniontown, Pa., Whitney, P. R.R.
50	Ellen No. 2	Whyel Coke Co., Uniontown, Pa., Whitney, P. R.R
100	Elizabeth	Unity-Connellsville Coke Co., Greensburg, Pa., Dorothy, P. R.R.
200	Elm Grove	W. J. Rainey, New York, N. Y., Elm Siding, B. & O.
125	Fort Hill	W. J. Rainey, New York, N. Y., Dickerson Run, P. & L. E.
101	Gilmore	Gilmore Coke Co., Uniontown, Pa., Smithfield, B. & O.
124	Grace	W. J. Rainey, New York, N. Y., Moyer, P. R.R.
272	Hecla No. 1	H. C. Frick Coke Co., Pittsburg, Pa., Hecla, P. R.R.
340	Hecla No. 2	H. C. Frick Coke Co., Pittsburg, Pa., Trauger, P. R.R.
300	Hecla No. 3	H. C. Frick Coke Co., Pittsburg, Pa., Hecla, P. R.R.
8	Helen	Samuel J. Lohr, Youngwood, Pa., Weaver's Old Stand, P. R.R.
355	Hostetter	Hostetter-Connellsville Coke Co., Pittsburg, Pa., Hostetter P. R.R.
145	Humphreys	Bessemer Coke Co., Uniontown, Pa., Trauger, P. R.R.
42	Jimtown	Shannon Coal & Coke Co., Pittsburg, Pa., Jimtown, B. & O.
38	Johnson	Johnson Fuel Co., Uniontown, Pa., Percy, B. & O.
250	Juniata	H. C. Frick Coke Co., Pittsburg, Pa., Juniata, B. & O.
306	Kyle	H. C. Frick Coke Co., Pittsburg, Pa., Fairchance, P. R.R.-B. & O.
499	Leisenring No. 1	H. C. Frick Coke Co., Pittsburg, Pa., Leisenring, P. R.R.-B. & O.
496	Leisenring No. 2	H. C. Frick Coke Co., Pittsburg, Pa., Bute, P. R.R.
502	Leisenring No. 3	H. C. Frick Coke Co., Pittsburg, Pa., Monarch, P. R.R.
304	Leith	H. C. Frick Coke Co., Pittsburg, Pa., Leith, P. R.R.-B. & O.
227	Lemont No. 1	H. C. Frick Coke Co., Pittsburg, Pa., Darent, P. R.R.-B. & O.
350	Lemont No. 2	H. C. Frick Coke Co., Pittsburg, Pa., Lemont, B. & O.
20	Little Sunshine	King Coke Co., Uniontown, Pa., Humphries, P. R.R.
32	Love	C'ville Mutual Coal & Coke Co., Scottdale, Pa., Mutual, P. R.R.
40	Magee	Magee Coke Co., Uniontown, Pa., Clare, P. R.R.
84	Mahoning	Mahoning Coal & Coke Co., Connellsville, Pa., Dunbar, P. R.R.
509	Mammoth	H. C. Frick Coke Co., Pittsburg, Pa., Mammoth, P. R.R.
400	Marguerite	H. C. Frick Coke Co., Pittsburg, Pa., Marguerite, P. R.R.
360	Mt. Braddock	W. J. Rainey, New York, N. Y., Mt. Braddock, B. & O.-Gist, P. R.R.
310	Mt. Pleasant	Mt. Pleasant Coke Co., Greensburg, Pa., Hecla, P. R.R.

This Way Out!

Written Expressly for Coal Age by R. T. STROHM

We're not just sore on the breaker,
With its jarrin' an' its noise,
But we're mighty sure that it makes a poor
Sort of job for a bunch of boys.
It ain't that our backs git tired,
Or we hate the dusty air;
But we dassent shirk when the mine's at work;
We've got to be right there.

In spring, when the season opens
For the black bass an' the trout,
The green earth calls through the breaker's walls
An' invites us fellers out.
An' then, for a day of fishin'
We would sell our precious souls;
But no one goes—till a sly guy throws
A switch-point in the rolls.

What's more, in the heart of summer,
With the sun a-peltin' down,
The posters flare an' the trumpets blare
An' the circus comes to town.
But we never git to see it,
For we're busy pickin' coals—
Unless some friend takes a chance to send
A switch-point through the rolls.

Perhaps it's a red-hot finish
In the bush-league pennant race,
An' the home boys need just a game to lead
An' to land in the highest place.
We know where the ball-park's fences
Show a hundred chinks an' holes;
So no one grieves when an unknown heaves
A switch-point in the rolls.

195	Mutual	H. C. Frick Coke Co., Pittsburg, Pa., Mutual, P. R.R.
32	Myers	Brownfield-C'ville Coke Co., Uniontown, Pa., Tarr, P. R.R
329	Nellie	Brown & Cochran, Dawson, Pa., Dickerson Run, P. & L.E.
252	Oliphant	H. C. Frick Coke Co., Pittsburg, Pa., Oliphant Furnace, P. R.R.
328	Oliver No. 1	Oliver & Snyder Steel Co., Pittsburg, Pa., Redstone Jct., P.R.R.-Oliver, B. & O.
480	Oliver No. 2	Oliver & Snyder Steel Co., Pittsburg, Pa., Redstone Jct., P. R.R.-Oliver, B. & O.
300	Oliver No. 3	Oliver & Snyder Steel Co., Pittsburg, Pa., Thaw Station, P. R.R.
50	Painter	Newcomer Coke Co., Uniontown, Pa., McClure, B. & O.
175	Paul	W. J. Rainey, New York, N. Y., Dickerson Run. P. & L. E.
400	Phillips	H. C. Frick Coke Co., Pittsburg, Pa., Phillips Mine, P. R.R
95	Rainey	W. J. Rainey, New York, N. Y., Dawson, B. & O.
443	Redstone	H. C. Frick Coke Co., Pittsburg, Pa., Brownfield, P. R.R.-Moore Jct., B. & O.
550	Revere	W. J. Rainey, New York, N. Y., Revere Works, P. R.R.
110	Rist	H. C. Frick Coke Co., Pittsburg, Pa., Morgan, B. & O.
26	Sapper	Sapper Coke Co., Uniontown, Pa., Leckrone, M. R.R.-High House, B. & O.
110	Semet-Solvay	Semet-Solvay Co., Dunbar, Pa., Dunbar, P. R.R.-B. & O.
36	Shirey	South Fayette Coke Co., Uniontown, Pa., Baggaley, P. R.R.
448	Shoaf	H. C. Frick Coke Co., Pittsburg, Pa., Shoaf, B. & O.
560	Southwest No. 1	H. C. Frick Coke Co., Pittsburg, Pa., Morewood, P. R.R.
150	Southwest No. 2	H. C. Frick Coke Co., Pittsburg, Pa., Alice Mines, P. R.R.
204	Southwest No. 3	H. C. Frick Coke Co., Pittsburg, Pa., Tarr, P. R.R.
903	Standard	H. C.Frick Coke Co., Pittsburg,Pa., Mt. Pleasant, P. R.R.-B. & O.
155	Stewart	Stewart Iron Co., Lim., Uniontown, Pa., Uniontown, P. R.R.-B. & O.
204	Summit-Eagle	H. C. Frick Coke Co., Pittsburg, Pa., Summit, B. & O.; Summit Ter. P. & L. E.
40	Thomas	Wh[illegible] Coke Co., Uniontown, Pa., Smiley, B. & O.
464	Trotter	H. [illegible] Frick Coke Co., Pittsburg, Pa., Trotter, P. R.R.-B. & O.
50	Union	W. J. Rainey, New York, N. Y., Alverton, P. R.R.
350	United	H. C. Frick Coke Co., Pittsburg, Pa., United, P. R.R.
200	Valley	H. C. Frick Coke Co., Pittsburg, Pa., Valley Works, P. R.R.-B. & O.
80	Veteran	Mt. Pleasant Coke Co., Greensburg, Pa., Udell, P. R.R.
33	West Penn	West Penn Coke Co., Pittsburg, Pa., Udell, P. R.R.
80	White	H. C. Frick Coke Co., Pittsburg, Pa., Sherrick. B. & O.
352	Whitney	Hostetter-Connellsville Coke Co., Pittsburg, Pa., Whitney, P.R.R.
300	Wynn	H. C. Frick Coke Co., Pittsburg, Pa., Wynn Works, P. R.R
500	Yorkrun	H. C. Frick Coke Co., Pittsburg, Pa., Yorkrun, M. R.R.-B. & O.
245	Youngstown	H. C. Frick Coke Co., Pittsburg, Pa., Stambaugh, B. & O., P. R.R.
21,582		

LOWER CONNELLSVILLE REGION

40	Adah	Adah Coke Company, Uniontown, Pa., Cheat Haven, B. & O.
400	Alicia	W. Harry Brown, Alicia, Pa., South Brownsville M. R.R.
200	Allison No. 1	W. J. Rainey, New York, N. Y., Allison, M. R.R.
200	Allison No. 2	W. J. Rainey, New York, N. Y., Allison, M. R.R.
142	American No. 1	American C'ville, Coke Co., Pittsburg, Pa., Linn, P. R.R.
240	American No. 2	American C'ville. Coke Co., Pittsburg, Pa., Martin, M. R.R.
50	American No. 3	American C'ville. Coke Co., Pittsburg, Pa., Newcomer, P. R.R.
40	Anica	Wilkey & Feather Coke Co., Uniontown, Pa., Whitsett Junction, P. & L. E.
120	Atcheson	Republic Iron & Steel Co., Youngstown, O., Gans, B. & O.
42	Bellevernon	Bellevernon Coal & Coke Co., Pittsburg, Pa., Bellevernon, P. & L. E.
257	Besco	I. W. Semans, Uniontown, Pa., Besco, P. R.R.
100	Bridgeport	H. C. Frick Coke Co., Pittsburg, Pa., South Brownsville, M. R.R.
470	Brier Hill	Brier Hill Coke Co., Brier Hill, Pa., Brier Hill, M. R.R.
20	Browning	Browning Coke Co., Uniontown, Pa., Vance Mill Jct., P. R.R.
50	Brownsville	Brownsville Coke Co., Uniontown, Pa., Brownsville, P. R.R.-P. & L. E.-M. R.R.
426	Buffington	H. C. Frick Coke Co., Pittsburg, Pa., New Salem, M. R.R.
34	Burchinal	Smithfield Coal & Coke Co., Smithfield, Pa., Smithfield, B. & O.
34	Byrne	Byrne Coal & Coke Co., Scottdale, Pa., Yukon, P. R.R.
205	Century	Century Coke Co., Brownsville, Pa., Brownsville, M. R.R.
40	Champion	Champion Connellsville Coke Co., Brownsville, Pa., Brownsville, P. R.R.-M. R.R.-P. & L. E.
500	Colonial No. 1	H. C. Frick Coke Co., Pittsburg, Pa., Smock. P. R.R.
156	Colonial No. 3	H. C. Frick Coke Co., Pittsburg, Pa., Grindstone, P. R.R.
200	Colonial No. 4	H. C. Frick Coke Co., Pittsburg, Pa., Grindstone, P. R.R.
120	Crystal	United Connellsville Coke Co., Pittsburg, Pa., Gans, B. & O.
250	Dearth	H. C. Frick Coke Co., Pittsburg, Pa., Low Phos., M. R.R.
236	Denbo	Reliance Coal & Coke Co., Pittsburg, Pa., Denbo, P. R.R.
402	Donald Nos. 1 & 2	Consolidated C'ville Coke Co., Uniontown, Pa., Grays Landing, M. R.R.
160	Donald No. 3	Consolidated C'ville Coke Co., Uniontown, Pa., Grays Landing, M. R.R.
500	Edenborn	H. C. Frick Coke Co., Pittsburg, Pa., Edenborn, M. R.R.
149	Edna	Waltersburg Coke Co., Uniontown, Pa., Waltersburg, P. R.R.
32	Emery	South Fayette Coke Co., Uniontown, Pa., Leckrone, B. & O.-M. R.R.
132	Eleanor	Sunshine Coal & Coke Co., Uniontown, Pa., Low Phos., M. R.R.
200	Fairbank	Struthers Coal & Coke Co., Cleveland, O., Fairbanks, M. R.R.
32	Finley	Jas. Byrne & Co., Uniontown, Pa., New Salem, M. R.R.
400	Footedale	H. C. Frick Coke Co., Pittsburg, Pa., Footedale, M. R.R.
80	Fretts	South Fayette Coke Co., Uniontown, Pa., Messmore, P. R.R.
119	Garwood	Etna-C'ville Coke Co., Connellsville, Pa., Simpson, M.R.R
58	Genuine	Genuine Connellsville Coke Co., Waltersburg, Pa., Waltersburg, P. R.R.
400	Griffin	Bessemer Coke Co., Pittsburg, Pa., Masontown, M. R.R.
45	Hillside	Westmoreland Gas Coal Co., Pittsburg, Pa., Madison, P. R.R.
210	Herbert	Connellsville Central Coke Co., Pittsburg, Pa., Low Phos, M. R.R.
38	Hope	Hope Coke Co., Uniontown, Pa., High House, B. & O.
74	Hoover	James H. Hoover, M'Clelland'twn, Pa., Ache Junction, M. R.R.-P. R.R.
195	Hustead	Hustead-Semans Coal & C. Co., Uniontown, Pa., East Millsboro, M. R.R.
260	Isabella	Isabella-Connellsville Coke Co., Pittsburg, Pa., Isabella Sta., M. R.R.
140	Katherine	Union-Connellsville Coke Co., Uniontown, Pa., Simpson, M. R.R.
200	LaBelle	LaBelle Coke Co., LaBelle, Pa., LaBelle, M. R.R.
220	Lafayette	Atlas Coke Co., Helen, Pa., Helen, P. R.R.
462	Lambert	H. C. Frick Coke Co., Pittsburg, Pa., Lambert, M. R.R.
516	Leckrone	H. C. Frick Coke Co., Pittsburg, Pa., Leckrone, B. & O.-M. R.R.
30	Leon	Franklin Coke Co., Mt. Pleasant, Pa., Tippecanoe, P. R.R.
400	Lincoln	Lincoln Coal & Coke Co., Scottdale, Pa., Waltersburg, P. R.R.
40	Little Gem	Bixler Coal & Coke Co., Pittsburg, Pa., Edna, B. & O.
250	Low Phos	Connellsville Central Coke Co., Pittsburg, Pa., Low Phos, M. R.R.
34	Luzerne	Luzerne Coal & Coke Co., Pittsburg, Pa., Luzerne, M. R.R.
64	Marion	Southern Connellsville Coke Co., Uniontown, Pa., Cheat Haven, B. & O.
244	Martin	Republic Iron & Steel Co., Youngstown, O., Martin, M.R.R.
202	McKeefrey	McKeefrey Coal Co., Leetonia, Ohio, Martin, M. R.R.
300	Mt. Hope	Snowden Coke Co., Pittsburg, Pa., Linn, P. R.R.
60	Murphy	Echard Coal & Coke Co., Connellsville, Pa., Star Junction, P. & L. E.
30	Newcomer	Newcomer Coke Co., Uniontown, Pa., Newcomer, P. R.R
100	Old Home	W. J. Parshall, Uniontown, Pa., Parshall, M. R.R.
480	Orient	Orient Coke Co., Uniontown, Pa., Orient, M. R.R.
34	Parshall No. 1	Puritan Coke Co., Uniontown, Pa., Parshall, M. R.R.
168	Parshall No. 2	Puritan Coke Co., Uniontown, Pa., Parshall, M. R.R.
30	Perry	Perry Coke Co., Pittsburg, Pa., Perryopolis, P. & L. E.
72	Plumer	Plumer Coke Co., Uniontown, Pa., Leckrone, M. R.R.-B. & O.
101	Poland	Poland Coal Co., Pittsburg, Pa., Poland, M. R.R. Extension
400	Republic	Republic Iron & Steel Co., Youngstown, O., Republic, M. R.R.
86	Rice	Rice Coal & Coke Co., Connellsville, Pa., Bourne, B. & O.
120	Rich Hill	Rich Hill Coke Co., Outcrop, Pa., Outcrop, B. & O.
350	Ronco	H. C. Frick Coke Co., Pittsburg, Pa., Ronco, M. R.R.
373	Royal	W. J. Rainey, New York, N. Y., Royal Works, P. R.R.
60	Sackett	H. R. Sackett Coal & Coke Co., Smithfield, Pa., Outcrop, B. & O.
378	Searight	Taylor Coal & Coke Co., Uniontown, Pa., Low Phos., M. R.R.
260	Shamrock	Fayette Coke Co., New Salem, Pa., New Salem, M. R.R.
100	Solon	Prospect Coal & Coke Co., Uniontown, Pa., New Salem, M. R.R.
310	Sterling	Consolidated C'ville Coke Co., Uniontown, Pa., Masontown, M. R.R.
400	Thompson No. 1	Thompson-C'ville Coke Co., Pittsburg, Pa., Republic, M. R.R.
400	Thompson No. 2	Thompson-C'ville Coke Co., Pittsburg, Pa., Republic, M. R.R.
320	Tower Hill No. 1	Tower Hill-C'ville Coke Co., Uniontown, Pa., Republic, M. R.R.
394	Tower Hill No. 2	Tower Hill-C'ville Coke Co., Uniontown, Pa., Republic, M. R.R.
500	Washington No. 1	Washington Coal & Coke Co., Dawson, Pa., Star Junction, B. & O.-P. & L. E.
500	Washington No. 2	Washington Coal & Coke Co., Dawson, Pa., Star Junction, B. & O.-P. & L. E.
76	Wineland	Banning Connellsville Coke Co., Uniontown, Pa., Banning, B. & O.
60	Winmore	Wineland-Gilmore Coal & Coke Co., Uniontown, Pa., Smithton, B. & O.
36	Yukon	Whyel Coke Co., Uniontown, Pa., Yukon, P. R. R.
17,428		

UPPER CONNELLSVILLE REGION

120	Atlantic No. 2	Atlantic Crushed Coke Co., Greensburg, Pa., Bradenville, P. R.R.
60	Atlantic No. 3	Atlantic Crushed Coke Co., Greensburg, Pa., Bradenville, P. R.R.
50	Chester No. 2	E. A. Humphries Coal & Coke Co., Scottdale, Pa., Bradenville, P. R.R.
208	Connellsville	Latrobe-Connellsville Coke Co., Latrobe, Pa., Bradenville, P. R.R.
293	Derry No. 1	Latrobe-Connellsville Coke Co., Latrobe, Pa., Bradenville, P. R.R.
50	Derry No. 2	Latrobe-Connellsville Coke Co., Latrobe, Pa., Bradenville, P. R.R.
244	Duquesne	Bessemer Coke Co., Pittsburg, Pa., Bradenville, P. R.R.
161	Fort Palmer	Westm'd-C'ville Coal & Coke Co., Pittsburg, Pa., Fort Palmer, L. V. R.R.-P. R.R.
202	Graceton	Graceton Coke Co., Graceton, Pa., Graceton, P. R.R.
136	Latrobe No. 1	Latrobe Coal Co., Altoona, Pa., Latrobe, P. R.R.
50	Lizonier No. 2	Lizonier Coal Co., Latrobe, Pa., Derry, P. R.R.
53	Lockport	Bolivar Coal & Coke Co., Pittsburg, Pa., Lockport, P. R.R.
136	Loyalhanna	Loyalhanna Coal & Coke Co., Philadelphia, Pa., Loyalhanna, P. R.R.
40	Marietta No. 1	Marietta-Connellsville Coke Co., Connellsville, Pa., Wilpen, L. V. R.R.-P. R.R.
80	Marietta No. 2	Connellsville Coal & Coke Co., Connellsville, Pa., Wilpen, L. V. R.R.-P. R.R.
75	Monastery	H. C. Frick Coke Co., Pittsburg, Pa., Latrobe, P. R.R.
200	Old Colony	Greensb'g-Connellsville Coke Co., Latrobe, Pa., Latrobe, P. R.R.
80	Saxman	Latrobe-Co'lsville Coke Co., Latrobe, Pa., Latrobe, P. R.R.
71	Superior No. 1	Latrobe-Connellsville Coke Co., Latrobe, Pa., Latrobe, P. R.R.
167	Wilpen	The Shenango Furnace Co., Pittsburg, Pa., Wilpen, L. V. R.R.-P. R.R.
300	Wharton	Wharton Coal & Coke Co., Coral, Pa., Coral Station, P. R.R.
2776		

GREENSBURG-CONNELLSVILLE REGION

57	Carbon	Keystone Coal & Coke Co., Greensburg, Pa., County Home Jct., P. R.R.
193	Donohoe	Donohoe Coke Co., Greensburg, Pa., Greenwald Station, P. R.R.
100	Huron	Keystone Coal & Coke Co., Greensburg, Pa., Dundale, P. R.R.
400	Jamison No. 1	Jamison Coal & Coke Co., Greensburg, Pa., Luxor, P. R.R.
516	Jamison No. 2	Jamison Coal & Coke Co., Greensburg, Pa., Hannastown, P. R.R.
491	Jamison No. 4	Jamison Coal & Coke Co., Greensburg, Pa., Crabtree, P. R.R.
40	Marthabel	Northern Connellsville Coke Co., Connellsville, Pa., County Home, P. R.R.
283	Salem	Keystone Coal & Coke Co., Greensburg, Pa., Allsworth, P. R.R.
2080		

Normal Production in Iowa

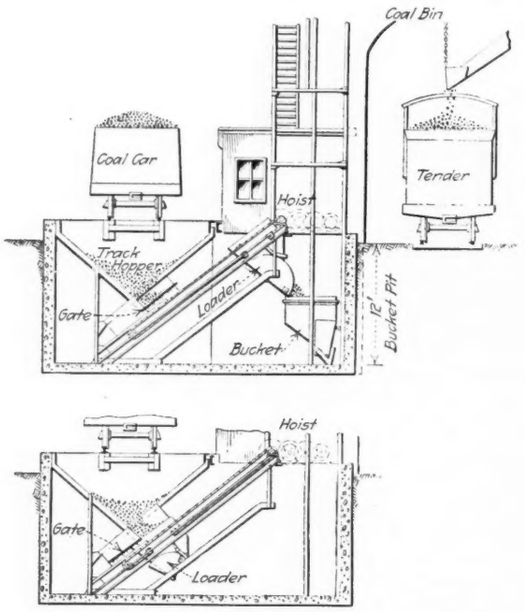
Coal production in Iowa in 1914 showed a decrease of 1 per cent. as compared with 1913, the output in 1914 being 7,451,022 short tons, valued at $13,364,070, according to figures of the Geological Survey. The number of men employed in the mines of Iowa increased from 15,757 in 1913 to 16,057 in 1914, and the average number of working days increased from 195 to 204.

Iowa is no exception to the states of the interior in which powder mining by shooting from the solid is practiced to a reprehensible degree, and the record in that respect in 1914 is worse than in either 1913 or 1912. The quantity of coal shot off the solid in 1914 was 5,545,842 tons, or 74.4 per cent. of the total; in 1913 it was 72.3 per cent., and in 1912, 69 per cent.

Shallow-Pit Coaling Station

A new design of coal-handling plant for railway coaling stations of the elevator-bucket type has a bucket pit only 12 ft. deep. This reduces the cost of the underground work and may preclude trouble with water which would be encountered with the deeper pit usually required where the coal is fed by gravity from the track hopper to the elevator bucket.

The special feature, as shown in the accompanying drawing, is that the coal is led through an undercut roller gate to a traveling loader, or bucket. This loader runs



MACHINE FOR COALING SHIPS AT WORKINGTON HARBOR, ENGLAND

up inclined guides and dumps the coal into the elevator bucket, which in turn delivers it to the elevated bin in the usual way. The loader is of 2½ tons' capacity. It is geared to the automatic electric hoist that operates the elevator bucket, and the movement of the loader effects the opening and closing of the gate. This coaling plant is manufactured by the Roberts & Schaefer Co., of Chicago. —*Engineering News.*

Indians Predict Cold Winter

The old-time Indians of the Southwestern States are prophesying an unusually long, cold winter this season. They say that the squirrels have already begun storing up goods, the bark on the trees is thicker than ordinarily, the summer has been abnormally cold and wet, the migration of birds started very early and numerous other signs which according to the aborigines never fail all go to forecast a winter of unusual severity.

It is noticeable that the full-blooded Cherokees in the Spavinaw country of Oklahoma are making extraordinary preparations for winter. For the first time in years they have stored up a surplus of fuel and food and are advising their white brethren to do likewise.

Last fall the Mesa Verde prairie dogs deserted their villages in Colorado for new ones, and the Indians visiting that locality for trading purposes shook their heads over it all winter, and said, "Rain, much rain all summer." Their prediction in this case seems to have come true. Now they are of the opinion that a very cold winter is in prospect, because the deer are more plentiful than for years, while rabbits are so numerous that one can scarcely go about without seeing them in large numbers. Coyotes and mountain lions are also unusually plentiful, which may be explained by the abundance of small game on which they live. If these Indian predictions can be relied upon, the coal man will come into his own this winter.

More Anthracite Is Consumed in Hard-Coal Region

The increase in the amount of anthracite coal sold to the local trade and used by employees in the anthracite region of Pennsylvania, according to the latest annual report of the Department of Mines, is wholly disproportionate to the increase in population. If the amount of fuel consumed in the home is a true index of the prosperity of the region, it has prospered mightily in the decade from 1903 to 1913. The following table of the number of tons of anthracite sold to local trade and used by employees does not include the coal used at the collieries for steam and heat, which amounts to over 10% of the entire production:

Year	Tons	Year	Tons
1903	1,378,167	1909	1,805,284
1904	1,544,728	1910	1,868,369
1905	1,590,556	1911	1,990,093
1906	1,522,454	1912	2,160,096
1907	1,700,309	1913	1,943,238
1908	1,715,889		

It may be observed that there has been a steady increase in local consumption except in the year 1906, when there was a six weeks' suspension of mining while the operators and mine workers were negotiating a new agreement. There was no suspension in 1909 at the termination of this agreement, but in 1912 there was an increase in spite of the suspension. The winter of 1913 was the first of three successive warm winters, and there was a marked decrease in local consumption; but the total increase for the decade was 665,071 tons, or over 47 per cent.

The Life of Wood Pipe

D. C. Henny, a consulting engineer of the Reclamation Service at Portland, Ore., has made an investigation into the life of wood pipe on behalf of that service. His conclusions were published in *Engineering News* of Aug. 26.

The inquiry covered three general types of wood pipe—continuous wood-stave, sectional wood-stave and sectional-bored. The probable life of various kinds of pipe is as follows:

Wood	Condition	Years
Fir	Uncoated, buried in tight soil	20
Fir	Uncoated, buried in loose soil	4 to 7
Fir	Uncoated, in air	12 to 20
Redwood	Uncoated, buried in tight soil, loam or sand, and gravel	Over 25
Fir	Well coated, buried in tight soil	25
Fir	Well coated, buried in loose soil	15 to 20

When conditions are unfavorable to the complete saturation of the wood, the life of the pipe is materially reduced. Open soil and low water pressure make it certain that the wood will not be kept continuously moist throughout. But coating the pipe appears to give the same result as a tight soil cover, and in addition the tar used in the coat

possibly acts as a disinfectant. Incomplete saturation has a most serious effect on redwood, reducing its life to 15 years or less.

The author reaches the following conclusions:

(a) Under favorable conditions of complete saturation well-coated fir may last as long as uncoated redwood.

(b) Either pipe will have a longer life when well buried in tight soil than when exposed to the atmosphere. A life of 30 years and over may be reached, if a high, steady pressure is maintained.

(c) Either pipe will last longer if exposed to the atmosphere than if buried in open soil, such as sand, gravel and volcanic ash. This greater durability will only be obtained in a hot and dry climate, when the pipe is shaded from the sun.

(d) Under questionable conditions, such as light pressure of partly filled pipe, fir, even if well coated, may have only from one-third to one-half the life of redwood.

(e) Under light pressure the use of bastard-sawn staves in fir pipe should be avoided.

(f) The use of wooden sleeves in connection with wire-wound pipe is objectionable and has caused endless trouble and expense. It is possible that the objection may be partly overcome by dipping the ends of the sleeves in creosote and by applying to them a heavy coating of tar. The sleeve wood, however, will never be as perfectly saturated as the straight pipe, and full creosote treatment of the wood or else some form of metal sleeve, either riveted iron or steel, heavily coated, or cast iron will probably be well worth the extra cost.

(g) If wooden sleeves are employed on pipe from 10 in. up, they should be provided with individual bands to permit the taking up of leaks.

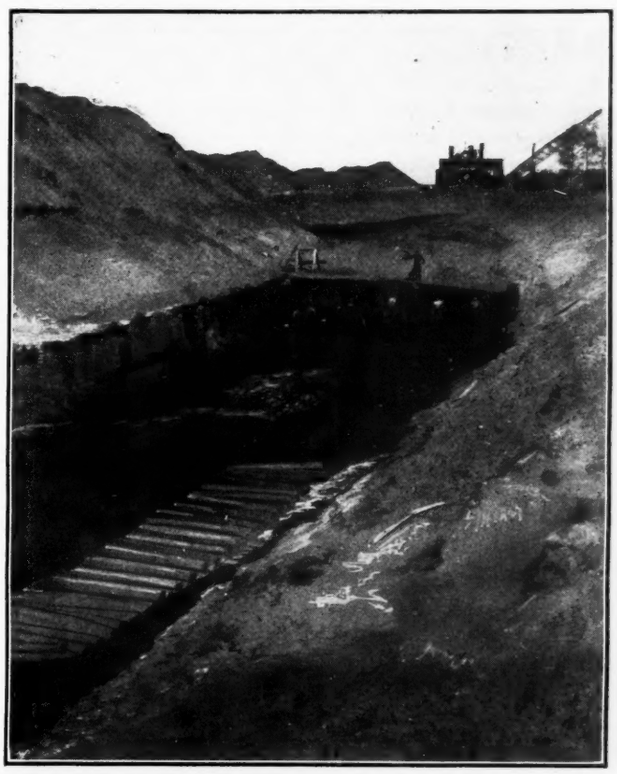
Wood pipe should not be used unless it can be kept full and under pressure during periods of use. The coating cannot under such conditions be expected to afford protection against decay. The coating should be continuous and heavy, and to be fully effective should be not less than $\frac{1}{16}$ in. thick, and it should preferably consist of more than one individual coat of a mixture of asphaltum and tar, or of an application of gas tar followed by one or more layers of refined coal tar. Little experience, however, can be quoted in support of all-tar coating.

Steam Shoveling in Alberta

Alberta has 85 per cent. of the coal of Canada and 40 per cent. of all the coal in the British Empire, according to a geological statistician. One-sixth part of the coal of the entire world is in Alberta. In the past 20 years 20,000,000 tons have been mined, and if continued at this rate, the supply would last 1,072,000 years. At the rate Canada is now using coal, Alberta could fill the demand for 100,000 years. If the world's demand for fuel did not increase, that province could supply the coal needs of both hemispheres for one hundred years and still there would be fuel on hand.

The estimator took into consideration only the known fields of today. There are stretches in the northwestern and extreme northern parts of the province that as yet have not been thoroughly explored. Most of the coal is a bituminous fuel of high grade and well-suited for battleship use. During the past year D. A. Thomas, the great coal operator of Wales, spent some time in the north country and sent out half-a-dozen survey parties into the as yet unknown regions of Alberta. It was stated at the time that the Thomas interests were directly connected with the British Admiralty.

While the coal of Alberta is mined in general in the usual way, there is one point in central western Alberta where strip-pit mining is practiced. This is in the neighborhood of Tofield, a small town upon the new Grand Trunk Pacific Ry., not far from the cities of Edmonton and Strathcona. Here the coal outcroppings appear in



TAKING COAL OUT WITH WAGONS AFTER EXCAVATION GOT TOO DEEP FOR SHOVEL

many places right on the surface, dipping gradually below the plain. The coal is of much better grade than is generally found lying so near the surface.

In this district the farmers nearly all have mines of their own, from which they get their supply of domestic fuel by pick and shovel. Near the town several companies have gone into the business on a larger scale. A steam shovel has been installed, and as will be seen, the seam is followed to a considerable depth.

Pulverized Chalk, Slack and Solidified Tar have been used as fuel in Canada after being compressed into briquettes the size of an egg. They burn freely without smoke and have a high calorific value.

Coke-Breeze Briquettes have been made successfully in Germany by the compression of the breeze after the addition of finely divided hard pitch, the whole being heated from 300 to 400 deg. C. Experiments with other binders such as thick and thin tar with additions of sawdust and coal dust failed because the briquettes ignited with too much difficulty.

Impure Carbide gives out small quantities of phosphureted hydrogen and hydrogen sulphide on being dampened, and these gases have an unpleasant odor, but they are not generated in sufficient quantity to be injurious to health. The gases burn with the acetylene generated, and the residues are harmless. The odor of the carbide is largely owing to its impurities.

Editorials

The Colliery Engineer Consolidates with Coal Age

The Hill Publishing Co., owner of *Coal Age,* has just purchased *The Colliery Engineer,* and commencing Nov. 6 the two journals will be combined and appear as a single paper, constituting the greatest weekly in the world devoted to coal and coke.

As a result of this combination, the readers of both papers will be benefited. Those who have read only one of the two journals hereafter will receive all the information and news the industry affords instead of only a part. Those who have subscribed to both papers will in the future effect a saving in money and time through the elimination of a considerable duplication.

The plans and scope of the new weekly will be modified and enlarged through the retention of all that was best in both papers, while at the same time new features will be inaugurated that could not have been attempted by either periodical alone.

A complete announcement of the hopes and ambitions of the editors of the new journal will be printed in the first issue of the enlarged weekly Nov. 6, at which time let us all, not only the editors, but all the friends and readers of *Coal Age* as well, greet our fellow-workers in the industry with warmest hospitality.

Living no longer as two families, the readers of the greatest weekly and the oldest monthly can feel additional security in the added strength that will now carry the unified papers through good times and bad. The result will be a vehicle that will have power to do more for the industry than both papers could ever have accomplished singly.

Gentlemen, All

At the banquet of the Nanticoke Mining Institute, held at Nanticoke, Penn., Oct. 16, Congressman John J. Casey received no little applause at his assertion that the anthracite strike would be avoided if the employers and employees would sit down and discuss their differences amicably, realizing that there was really no necessity for a suspension or a strike.

And clearly the making of a new contract should not be the occasion of bitterness. When two men who have contracted with each other in the past, one as a buyer and the other as a seller, meet to make a new bargain, there is no rancor. They often sit down and take a meal together, and their differences of viewpoint are harmonized by the effect of an excellent cuisine. Even the Arab knows that two men who eat together think in harmony.

But the miners and the operators meet to quarrel, and of course they succeed. There is trouble in the air, but there should not be. Antagonisms are capable of causing the failure of nearly all institutions. Even our own Federal Constitution is overlauded. We are told it keeps us free and happy. But if our people were filled with hatred and suspicion of one another, if our motives were of the lowest, the Constitution would inevitably fail to secure its own existence; much less would it afford us liberty and justice. The document, like all others, is less noble than the people who wrote it and who have later to defend it.

And it is so with any instrument framed to keep miner and employer in happy harmony. The contract between them is nothing unless it is an agreement between gentlemen, an understanding interpreted with friendliness and tact. There is in fact no room in a democracy for anyone but a gentleman; for when all men are equal, the personal restraint of each man is about the only assurance that even a single individual will receive his full rights.

It was interesting to hear Con Cole, a street-car motorman, mimic a miners' convention at the institute meeting and draw laughter from miners and operators in the sallies he made at the expense of both. This wage controversy is not an occasion for bigotry, and no gentleman is a bigot. It was a pity Con Cole could not also hold up to ridicule a body of operators engaged in the English sport of "viewing with apprehension." There is nothing more amusing than to meet a lot of operators and superintendents discussing the labor problem, unless it is to hear a number of workingmen canvassing the same subject.

Both may be expressing apprehension at the course affairs are taking, but surely both are giving good cause for such fears of the future. The only way to solve the mine-strike question is for miners and operators to get together and learn one another's views and put the quietus forever on partisan oratory. The crudity with which operators and miners alike try to suppress adverse opinion is deplorable. The matter of wage scale is an economic question to be debated scientifically. The choleric gentlemen, if gentlemen they can be termed, had better withdraw and leave the parleying to those who are willing to acknowledge the rights of the opposing party.

Of the rabid mine owner and the equally rabid mine worker it may be well said with Shakespeare, "A plague o' both your houses!"

Reducing the Water Problem

Many mines are more troubled with water removal than is necessary because no attempt is made to prevent it from reaching a lower level than the opening, or from passing to some point which, though higher than the mine entry, is yet so low that the water has to be pumped out.

There are many opportunities to impound water at a high point and pipe it to the mine mouth. On its way to that entry it may pass lower elevations than its point of delivery, but like the water in a city water-supply, that drop in the line will not prevent the water from being delivered by gravity to the elevation desired.

Even when water has to be pumped from a dip, it is not uncommon to pump it over one small elevation and

let it run downhill to another depression from which it must be pumped again. A continuous pipe through the second depression would have delivered the water to a point from which it would have traveled to the surface without further handling. The difficulties of handling mine water can usually be marvelously lightened when a good profile map has been constructed.

The minor depressions of an upper seam may not be coincident with the dips in other beds below, and it is well to keep this fact in mind. An undrainable point in one measure may coincide with an area in a lower with ample drainage facilities, and a borehole will take advantage of that fact.

The minor folds are the result of world stress when the beds were laid down or shortly after. They are usually different or slightly different with every bed and should not be assumed to be of the same character until the similarity is duly proved. A little care in selecting the drilling point may turn the trick. Even when two seams have their bathodic points immediately over one another, there may be a place in the upper seam which, if dried by drilling, would practically remove water from the whole upper dip, and this place may be beyond a dividing ridge in the lower bed and so may furnish the ideal spot for a borehole from the upper measure to the lower for drainage purposes.

Where a lower seam has been worked out, relief can be obtained in the upper by the process of drilling. It will be a matter of no interest then whether a low or a high spot in the lower bed is penetrated. The water will drain off in any event through the open places in the falls.

Drilling Sometimes Affords Drainage

Drainage into limestone crevices has been often advocated. Unfortunately where there are limestone and crevices there is often much water, and the practice of making a short hole or a well to the cretaceous stratum may make more trouble than it removes. But if a plug is kept handy when the hole is drilled and the driller is a man who does not fear a wetting, the risk is worth trying, for if conditions are unfavorable the hole can be plugged, and if they are propitious the water can be drained off.

There are wonderful possibilities of shutting off water from the surface by piping and flumming water past certain places where otherwise it would be engulfed. It must be remembered that water enters the mine not only through caves, but also through the open strata, and oftentimes a little care will make a wet measure dry. Sometimes a little carelessness in impounding water near a mine will make a dry mine wet and a water reservoir dry—a combination most trying to a superintendent.

The use of V-drains around falls is not as common as it should be, necessary as such drains are, and in wooded country little care is taken to protect such slight sinkages and cracks as may not yet have developed into caves, but which are already large enough to admit the water to the mine.

All this water passes to the surface eventually; the sooner it passes the more acid it is, for the sulphuric acid does not have time to become neutralized by alkalies. The less water there is to handle the longer the water may remain in the sumps for settlement. The water will then be heavy with ferric hydrate perhaps, but acid free. The hydrate is harmless and if necessary can be allowed to settle. The acid is the harmful constituent, and if the water remains long in the sumps it is quite likely to be so purified of acid as to be less harmful to pumps and boilers. Larger bodies of water cannot be impounded and are liable to do the maximum injury to engine and boiler parts. Probably a little lime dropped in a sump occasionally would make the water less harmful to equipment.

Mechanism of Thrift

Many of our national difficulties are of our own making. It is largely our fault that all our savings are the outcome of the rich man's profits rather than of the poor man's economies, for in most cases a miner or village industrial worker would have to take a whole day and spend a day's earnings if he wanted to bank his biweekly pay. The banks at such towns as are exclusively devoted to mining are few indeed.

Banks are usually started by business men who generally establish these institutions in their home towns. Hence the big cities have perhaps altogether too many of them and the villages only too few. Many of the foreigners are banking with irresponsible persons, though the stricter state laws are breaking up the business of these fly-by-night institutions. Yet in many places nothing adequate has been provided to replace them.

The wage roll of the mines, according to the Federal census of 1909, was $412,898,346. Of course some of this money was paid to men who live in sizable towns where banks are numerous. But in such places they are swell institutions to which the miner might well hesitate to go in his mining clothes and where, rightly or wrongly, he does not care to enter even when dressed up. He looks at the city or borough bank as a place for the rich.

As a result, even when they live in towns provided with banks, these men do not save, and the nation is deprived of the capital which they should accumulate. Thrift is discouraged, and the workman is blamed for faults of improvidence with which he is not rightly chargeable. But it will be said the Government provides a way of laying aside earnings, and that is true. Still the red tape at the post office makes the placing of savings with the Federal Government unpopular. A bank which will take money from the miner without his filling any application and will give him a receipt, even if he hasn't his bankbook with him, will be sure to do a good business, as soon as confidence is established.

In the mining village there is a large source of capital going to waste. If the miner can save 10 per cent. of his earnings, the aggregate will amount to $40,000,000 per annum, and that will furnish capital for a number of strong banks. Where they are established, miners are known to bank $5 and $10 per payday with unfailing regularity, even when the mines work irregularly, and the money once deposited is rarely withdrawn, for saving men usually do not migrate as readily as the unthrifty.

But banks at mining towns will not have to depend solely on the miners. They will be sure to draw agricultural deposits wherever the ground in the neighborhood is fertile, and the business derived from the small stores and local industries will tend to add profit and opportunity to the mine bank.

The National Bank of Ellsworth, Penn., is an example of such a successful institution. The time deposits

amounted last September to over $147,000 and the deposits subject to check to nearly $59,000. There were only about 1,100 men employed by the company at Ellsworth and Cokeburg. So per man there was $134 of deposits on time certificates and $54 of deposits subject to check. This is evidence that a good bank with a fair capitalization and a safe surplus can do a satisfactory business in any mining town.

The children in the Ellsworth schools alone have deposited $2,000 in the bank. This institution pays 4 per cent interest and compounds it quarterly. The total resources make the respectable showing of $275,619.05.

Only when the workingman invests his money will he defend the rights of investors; only then will he realize that the profits of investment are not outrageously high. We need also, as life-giving blood for our industries, the contributions of the workingmen, and we deliberately overlook this source of the nation's wealth when we fail to provide banks at small industrial centers like our coal-mining villages.

Legal Department

Liability of Surety on Coal Sales Contracts

By A. L. H. Street*

There is a well-settled general rule of law that a surety for the performance of a contract is released from liability by the act of the principals to the contract in changing the terms of the agreement in a material respect that increases the danger of the surety being held liable. This rule was lately invoked by a surety company, which secured performance of a coal-sales contract, in a suit passed upon by the United States Circuit Court of Appeals for the Third Circuit (Pittsburgh-Buffalo Co. vs. American Fidelity Co., 219 Federal Reporter 818).

Plaintiff had a contract to sell the output of the Annabelle mines, and under a collateral agreement appointed J. K. Dimmick & Co. as its exclusive agents in New England territory and as nonexclusive agents in a certain portion of the Middle Atlantic States. Each party executed a $25,000 bond to secure performance of the terms of this agreement, defendant becoming the surety. Claiming that Dimmick & Co. broke their contract in refusing to accept further shipments, plaintiff brought suit on its bond. The surety company defended on the ground that this contract had been materially altered without its consent. Under these circumstances the Circuit Court of Appeals held:

That, since the secured contract concerning sale of Annabelle coal did not restrict the parties thereto against making other contracts for sale of other fuel, the fact that Dimmick & Co. contracted with plaintiff to sell other grades of coal and coke, without notice to the surety company, did not constitute such departure from the secured contract as discharged the surety company from liability under the general rule of law stated above.

That, for like reasons, the surety cannot complain because plaintiff shipped coal other than Annabelle coal into territory where the secured contract gave Dimmick & Co. the exclusive sale of fuel of the latter grade.

That whether plaintiff's act in accepting notes from Dimmick & Co. for the price of coal delivered under the secured contract, instead of observing a clause in the agreement requiring monthly settlements, constituted such departure as released the surety depends upon whether the notes were accepted as full payment and whether the change in the manner of payment injuriously affected the surety.

That since the secured contract did not prescribe any penalty for failure of Dimmick & Co. to take 50 per cent. of the output of the Annabelle mines, as provided in the agreement, any such breach merely entitled plaintiff to enter the firm's otherwise exclusive territory and sell coal in competition with the firm to the extent of the quantities which the firm failed to take, and such breach did not constitute a departure from the contract in the sense that the surety company was released from liability.

*Attorney-at-law, St. Paul, Minn.

Recent Decisions

Right of Boss Trimmer to Recover for Injury—A boss trimmer is not entitled to recover damages for injury sustained in being crushed between the end of a coal car and a post of a tipple, resulting from his removal of a wooden block from a wheel of the car in moving the car in the process of loading, even though the car was of improper width, if he had authority to reject the car, or if the car was equipped with a sufficient brake by which he could have regulated movement of the car. (Michigan Supreme Court, Lewis vs. Wolverine Coal Co., 153 Northwestern Reporter, 26.)

Suit for Polluting Stream in Mining Operations—In a suit to recover damages resulting from defendant coal company's act in polluting the waters of a stream, spring and wells on nearby land in conducting its mining operations, it was not permissible for the defendant to show that in general the water in wells sunk near coal mines are impregnated with mineral, nor to show generally the kind of water found around coal mines. The effect of admitting such evidence would be to inject into the case collateral issues that would only in a very remote degree, if at all, shed any light on the main issues in the case. (Alabama Court of Appeals, Morton vs. Pratt Consolidated Coal Co., 68 Southern Reporter, 1015.)

Liability for Injury to Minor Employees Unlawfully Employed—When the employment of a minor is shown to be illegal, because forbidden by a statute like the Pennsylvania act of 1909, forbidding employment of boys under 16 in breakers, that in itself is sufficient evidence to charge the employer with actionable negligence, rendering him liable for injury to the minor sustained in the course of the employment. When sued for injury to a minor worker, the employer must justify the legality of the employment by proving that the employee was within the permitted age and that the employer had complied with all the statutory requirements in relation to the employment of persons of the age in question. If the law contains no provision by which the employer may protect himself, through certificates or other means, then he takes such workers into his service at his own risk, so far as their age is concerned, and a false statement by the employee in regard thereto will in no sense bar a recovery for subsequent injury. (Pennsylvania Supreme Court, Krutlies vs. Bulls Head Coal Co., 94 Atlantic Reporter, 459.)

Sociological Department

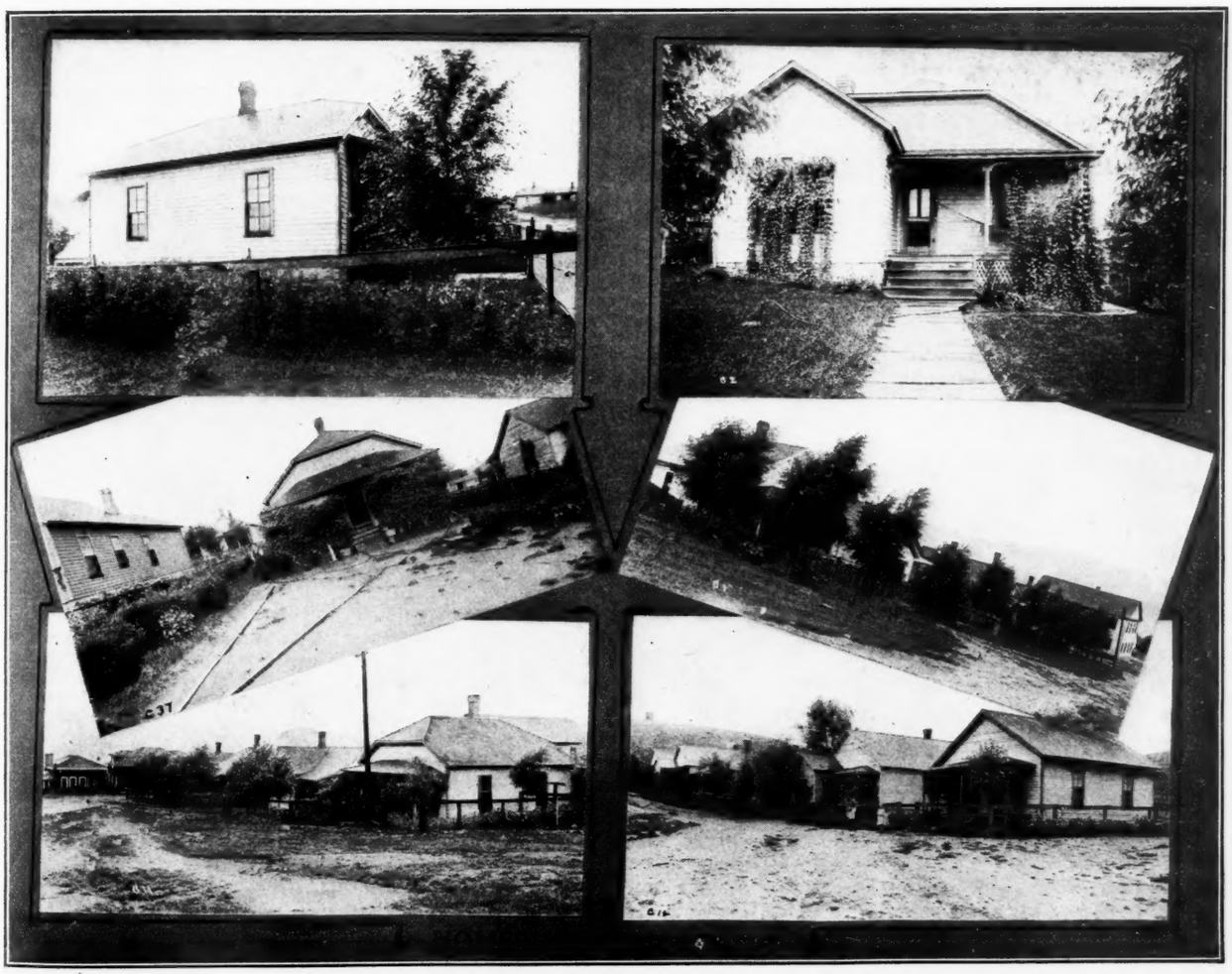
Colorado Fuel and Iron Co. Mining Villages

The Western villages are usually termed "camps" and probably in the earlier days they fully justified the name given them. But more recently there have been large improvements, and attempts have been made to supply ample water so that trees and flowers may be grown, and thus the permanent village has replaced the evanescent camp. Still if one looks at the views of the Colorado Fuel and Iron Co.'s houses at Frederick and Segundo, the uncompromising character of the ground will be noted, and the shrubs, creepers and flowers will reflect the care that has been needed and taken to embower at least the home, if the hills and the roadside must still remain unadorned.

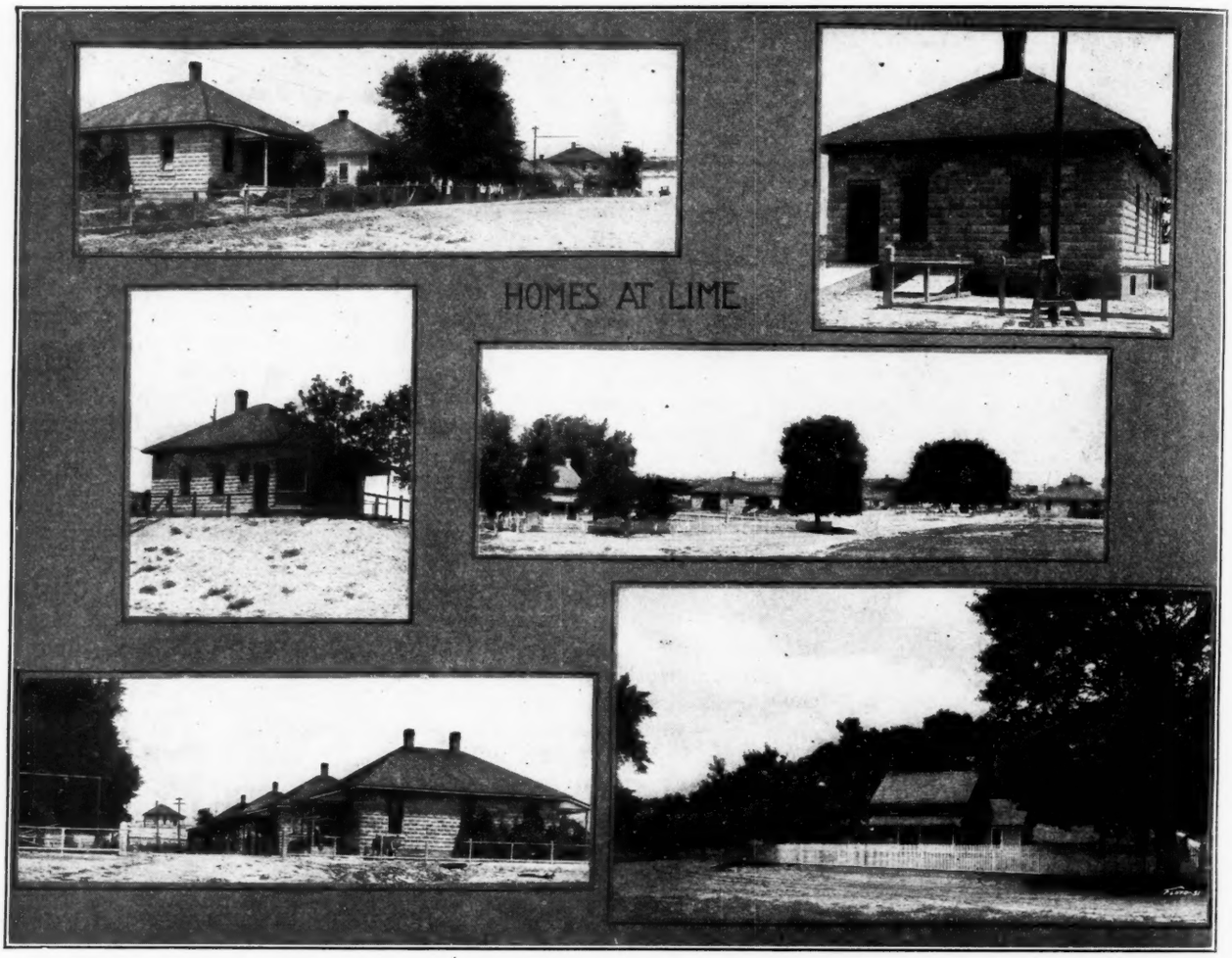
The limiting rent on these houses is $2 a room, which is higher than in the mining towns in the East by about 50 per cent.; but everything is expensive in the West owing to the long freightage, and in Colorado and Wyoming owing also to the poor quality and small size of the timber available. The rate of $2 per room seems quite general and justifiable in Colorado, Wyoming and New Mexico. But though the rent is higher than in Eastern mining villages, it is low as compared with that in incorporated towns and cities whether East or West.

A provision in the contract between the Colorado Fuel and Iron Co. and its employees stipulates that the rent shall only be limited to $2 per room when the building is without bath. The time is certainly coming when every miner will demand his bathroom and will be prepared to pay a larger rent to secure it.

The village of Segundo (or "Second"), here illustrated, is on Las Animas Creek, a branch of the Chicosa Creek, which itself empties into the Purgatory and thence into the Arkansas. The town lies about 14 mi. west of the small city of Trinidad, along the Colorado & Wyoming Ry. Lime, or San Carlos, near Pueblo, Colo., another village illustrated in this article, is not a coal town, but it shows well the ideals to which the Colorado Fuel and



SEGUNDO, ANOTHER VILLAGE OF THE COLORADO FUEL AND IRON CO., ADJOINS PRIMERO ON THE SOUTH



AT LIME, OR SAN CARLOS, NEAR PUEBLO, COLO., THE COLORADO FUEL AND IRON CO. HAS BUILT SOME OF ITS HOUSES OF CEMENT BLOCKS INSTEAD OF TIMBER

Iron Co. is tending. It is the fortunate possessor of some really fine trees, and those at Segundo look as if, at some time, they may also become tall and unbrageous.

Like the H. C. Frick Coke Co., the Colorado Fuel and Iron Co. finds its principal problem in the houses which it does not own. The Frick company finds many unfortunate conditions in the mill towns adjoining its plants, and it is trying, so far as it is able, to bring these into conformity with its ideals. The conditions in Colorado are somewhat different and are the result of a misjudged policy in the distant past, for in Sopris the Fuel company is successor to the results of an unfortunate policy inaugurated some 30 years ago. Miners were allowed to rent land for little or nothing and were encouraged to build on it. The Central European laborers were not choice as to the manner of construction of the homes which they built, yet the company did not want to confiscate the hovels which these foreigners had erected.

SILVER MEDAL PRESENTED BY ST. LOUIS EXPOSITION TO THE COLORADO FUEL AND IRON CO.

So the plan, soon seen to be wrong, was hard to discontinue so long as the tenants desired its continuance. The company, while legally free of responsibility, has determined to buy these shacks and put up desirable residences for the men. But it is likely that the tenants will imagine that the company cares nothing for their interests and is only anxious to secure the larger rent which the transference will make necessary. Sopris, by the way, is only about 6 mi. from the village of Segundo.

Alabama Safety Association First-Aid Meet

The Alabama Safety Association held its first-aid meet on Oct. 9. The winner of the white men's events was the Republic Iron and Steel Co.'s Palos Division team, with a score of 100. Second place was secured by the Woodward Iron Co. team from Dolomite, Ala., with a score of 97⅞. In all there were 14 teams competing.

The Wylam Ladies' team was the only corps of ladies in the contest. They surpassed even themselves, and so took first prize, obtaining a percentage of 97⅛. There were seven colored teams, and these had a separate competition, the first prize being awarded to the Alabama Fuel and Iron Co.'s Acmar Division team, which made a score of 95⅜.

The physicians who judged the event were selected by the Jefferson County Medical Association, and most of these had attended first-aid demonstrations prior to the contest to familiarize themselves with first-aid methods. The judging was consequently well performed. It is interesting to note that the Palos team of the Republic Iron and Steel Co. defended its title as an efficient first-aid organization by taking first place.

Discussion by Readers

Correct Tipple Design

I have read the article entitled "Correct Tipple Design" by M. L. Hyde, *Coal Age,* Sept. 18, p. 450, with much profit and appreciation. Nevertheless, in spite of Mr. Hyde's assurance that the methods and designs given are the best, I think there are some minor points on which it is possible for a difference of opinion to exist.

In the first place, I question whether it is good practice, in mines having a capacity of 600 tons per day, for the topman to act as lampman. Subsection 4 of sec. 124 of the Mines Act of the Province of Alberta states that "the bankman shall not leave the top of the shaft while men are ascending or descending same." Subsection 5 of sec. 113 of the same act states that "every person receiving one or more safety lamps before going on shift shall personally return them at the end of the shift to the lamphouse." I would ask, How is the bankman to see that every man returns his own lamp if he must act as topman as well as lampman? And how is he going to carry out subsection 4 of sec. 124 if he must be in the lamphouse giving out lamps to the men?

Then, again, the check system outlined in this article would seem to present some minor difficulties, though no doubt these could be overcome. Suppose a man while in the mine loses his light and, being unable to relight it, obtains a spare lamp. On going off shift he puts his check on the spare lamp instead of his own lamp. If he fails to hook his check on his lamp, he cannot get the lamp in the morning. Because he has failed to do this his check is not on his lamp and it cannot be located in the hurry of the topman in giving out lamps and caging the men at the same time.

There has been a good deal of literature written on the subject of spontaneous combustion, but I have never before read the statement made here that "waste from the tables is not liable to spontaneous combustion," etc. It seems to me that bone coal picked from the picking belts is liable to ignite spontaneously. As a matter of fact I have seen bone from picking tables ignite spontaneously. In the Lethbridge district the bone is more liable to spontaneous heating than the coal, and a little coal mixed with the bone is even more liable to spontaneous heating than either the bone or coal separately, and this mixture is what there would probably be in the bin under the picking tables.

I am rather inclined to think that 36 in. is a little too low for lights over a picking table. The pickers at most mines use picks to separate bone from any large lumps of coal, and the use of picks with lamps at this height would be liable to cause an unnecessary breakage of lamps. The distance apart of the lamps is not an arbitrary distance, such as 4 ft., but should be governed by the candlepower of the lamps used.

I certainly agree with Mr. Hyde that self-dumping cages are superior to other methods; also that there is a large amount of breakage in a weigh-pan. Nevertheless, I doubt if even steel cars could be kept with a dust-proof door, without a prohibitive cost for repairs. I am afraid that the "few dollars higher" cost would be found to be a very serious consideration, especially if repairs were considered. I fail to see how we can use self-dumping cages in combination with the system given to obviate the use of a weigh-pan, unless the mine-car scales are located at the shaft bottom. This, I think, would be an objectionable feature and would make it difficult to get the miner's check number as the car is weighed. About the only method of overcoming the difficulty is that adopted by Mr. Hyde in his standard tipple (described in the second part of the article), which apparently has no facilities at all for weighing the coal.

Aesthetic design is undoubtedly a nice thing, but I would be willing to sacrifice a little beauty in order to have the resultant pull on the rope fall a little farther inside the back stay of the tipple than is shown in Fig. 1 of the standard tipple.

J. B. DE HART.

Coalhurst, Alberta, Can.

Efficient Mine Foremen

Letter No. 8—A man to be an efficient mine foreman must fulfill the various requirements of the state mining laws, with which he should be fully acquainted. He must possess some technical knowledge, besides having much practical experience in the business of coal mining, which will enable him to meet successfully the conditions and problems that arise in the operation of the mine and apply the proper means for their control and regulation, and to safeguard the property of his employers and the health and lives of the men in his charge. He must possess the executive ability and diplomacy that will enable him to overcome the perplexing labor troubles incident to mining, while at the same time maintaining a good balance on the right side of the ledger. His technical training should include a knowledge of the elementary principles of chemistry, mechanics and geology.

To many, this may seem an unnecessary array of qualifications for the position of foreman in a mine, but a little reflection on the wide range of subjects and the principles involved in the duties of a foreman will convince such that the statement is limited rather than exaggerated. If there is any one subject more than another with which a mine foreman should be familiar, it is that of ventilation. All practical mining men should know that the output of a mine can be increased 100 per cent. by efficient ventilation.

In conversation with mine officials, I have often asked questions in regard to the ventilation of a mine for the sole purpose of ascertaining how much they knew of the elementary principles involved. In most cases, these questions were asked of practical mining men who know how to effectively ventilate a mine, but have no knowledge of the principles on which such ventilation depends. In other words, they have never asked themselves why

certain things produced certain results. No argument is needed to prove that greater effectiveness is gained, not only in ventilation, but in all branches of mining work in charge of the foreman, if that official knows why a thing is done as well as how it is done. To be most effective in any business, one must know the details of that business.

I may say that there is no industry that exhibits more effects of hidden causes than that of coal mining. Conditions and their effects confront the mine foreman on every hand, and the better he understands why these effects occur, the better he will be able to apply the most effective means for their prevention or removal.

I do not want to be understood as doubting the qualifications of a mine foreman who thoroughly understands how to ventilate a mine effectively. I only wish to emphasize how much more efficient is the foreman whose knowledge of the elementary principles involved in his work enables him to judge intelligently of the relative merits of the means he employs to accomplish certain ends.

In the ventilation of the mine, the foreman may be badly handicapped by inadequate means at his disposal for producing the required amount of air. Such a condition is not his fault, as he is seldom, if ever, consulted in reference to the design capacity or construction of the ventilator that will be best adapted to meet the requirements in the mine. These matters are wholly in the hands of the manager or the engineering department. But the efficient foreman can often make changes in the mine in regard to the plan of ventilation that will enable him to secure better results when the power producing ventilation is thus limited.

The subject of effective ventilation has been so emphasized in the Pennsylvania mining law that few, if any, mine foremen in the state fail to understand its value as a factor in the production of coal and the safety and health of the men employed in the mine. The point I would impress, in closing, is that the effectiveness of mine foremen would be greatly increased by a careful study of the simple principles that underlie our natural sciences and on which the work of mining depends.

A. M. Iner.

——, Penn.

Handling Explosives in Mines

Letter No. 2—I was glad to see the letter of James Thirtle, drawing attention to the need of greater care and caution in respect to the handling of explosive material in a mine. My observations lead me to think that much greater care is exercised in this regard in English collieries than in mines in this country. I beg to submit the following outline of the manner of handling explosives adopted by the Wigan Coal and Iron Co., at Leigh, Lancashire, England.

Magazine Is Well Protected

The powder magazine, which is located at a safe distance from the mine, is built of brick, has a strong iron door and is surrounded by an iron fence 7 ft. high. Both the door of the magazine and the gate in the fence are securely locked, except when the supply clerk in charge of the magazine enters to deliver the explosives required by applicants. Not more than 500 lb. of explosives is permitted in the magazine at one time, and no one but authorized persons is permitted to handle powder or detonators under any conditions. The system is as follows:

System of Handling Explosives

A shotfirer accompanies the supply clerk to the magazine, where he receives the required daily supply of powder and detonators from the clerk. The latter notes down in a book the amount of powder and the number of detonators given out, which enables him to know at any time the amount of each explosive remaining in the magazine.

The shotfirer, having placed the detonators in a metallic canister designed especially for their use and securely locked, delivers the canister to an official at the bottom of the shaft, who is authorized to receive the detonators and who counts them and notes the number thus received. Not more than 100 detonators are permitted to be kept in the mine at one time. The shotfirer then takes the powder he has received and places it in locked boxes, in amounts not to exceed 5 lb. in a box, in different places in the mine, where it will be convenient for his use. Not more than one box containing a supply of powder is permitted on a single split of air.

Firing the Shots

Having done this the shotfirer proceeds to examine each place in his district and ascertain the number of holes to be fired that day. Before quitting time the shotfirer goes to the bottom of the shaft and gets the number of detonators he requires in his district from the official to whom they were previously delivered. Each shotfirer must note down in a book the number of detonators taken out by him and the date when taken and sign his name. He must also examine and sign the mine examiner's report, observing carefully if any gas is reported in his district and where. No shot is allowed to be fired within 50 yd. of any place reported as containing gas, however small a quantity of gas may have been found, unless the gas has been removed three hours previous to the time of firing the shot.

All shots are fired by the shotfirer between shifts and when not more than 10 men are in the mine, which number includes the shotfirers and their assistants only. Having secured the necessary number of detonators, the shotfirer proceeds to charge and tamp each hole, using a wooden tamping rod and clay for tamping the shot. All shots are fired by electric battery and cable. Only one shot is fired at a time, the shotfirer carrying the battery with him when he goes to connect the cable with the wires of the detonator. The cable is of sufficient length to permit the shotfirer to reach a safe distance from the shot. Before firing another shot he must examine the place where the previous shot was fired and 50 yd. on each side of the same. Special precautions are taken when blasting on main-intake and main-haulage roads. The roads are swept clean of dust for a distance of 50 yd. on each side of the shot and well watered. All electric current is shut off from power lines at the surface when shotfiring is in progress below.

Treatment of a Misfire

A misshot, when found, is fenced off, and the person who drilled the previous hole is instructed to drill another relieving hole at the side of and at least 1 ft. apart from

the misshot and 6 in. deeper. In order to show the direction of the hole and avoid the possibility of the drill striking the unexploded charge when drilling the relieving hole, it is customary to draw a line on the roof showing the direction of every hole drilled. When firing a relieving hole the shotfirer must first set a post near the shot, and having attached a piece of old cable to the detonator wire of the misshot, he fastens the other end of the old cable to the post. This enables him to trace and find the detonator cap if this is not exploded when the relieving shot is fired. The missed detonator, if found, is taken outside by the shotfirer and delivered to the superintendent, who tries it again with a special battery kept in his office for that purpose. This is done to ascertain whether or not the detonator was perfect.

When the shotfirer has completed his work, he notes down in a book the number of shots fired, detonators used and the number of misshots, if any. The book form is somewhat as follows:

Detonators				Shots				
On Hand	De-livered	Re-turned	Balance	Coal	Roof	Missed	Date	Sign
100	30	0	70	25	5	0	10/23	F.B.

Every shotfirer undergoes a period of training as an assistant to an old experienced man, and he is not permitted to fire any shots on his own judgment until he has had the experience that will permit him to judge correctly of the quantity of powder required in different shots, depending in each case on the nature of the coal and the position of the hole. Such precautions as these, if followed in mines in this country, would make blown-out shots and accidents from blasting coal a thing of the past.

JACOB RILEY.

Universal, Ind.

Prohibition and Welfare Work

Letter No. 5—I have read with deep interest the several letters written on this subject. I believe the question of prohibition is worthy of the most careful consideration by all mine officials and miners who desire better conditions in and about the mines.

LIQUOR AND THE SAFETY-FIRST IDEA

The liquor question in mining is closely connected with the safety-first idea and all efforts for betterment of mining conditions. It is strange that men who believe that the safety-first movement is the best thing that ever happened will close their eyes to the sale and use of liquor in the camp. Even where a saloon is not permitted in a mining town, a "sminkey" or "speakeasy" is to be found. I would ask, What is the use of urging the safety-first idea and putting up danger signs and other safeguards against accidents when ways are provided for men to get their liquor, and as a result, a considerable portion of the workmen enter the mines in the morning with their faculties dulled and their senses blinded to danger?

THE BOOTLEGGING EVIL

I have heard it argued that it is better to allow a saloon in the town for the reason that the whisky sold by saloons is purer than that sold by bootleggers. Again, it is claimed that whisky is a good medicine, and no doubt it is; but where one is cured by its use, how many there are who are killed owing to their own indulgence or that of others. I have known men to claim sickness in order to get the whisky they wanted to drink. In the discussion of the "Liquor Question in Mining," a short time since, I was much pleased with the letter of George N. Lantz, Vol. 7, p. 731, every word of which I can indorse. This was followed, on the same page, by another letter signed "A Mine Foreman," in which attention was drawn to the important fact that the license of the sale of liquor by the Federal Government in any of the states encourages the practice of bootlegging, in direct opposition to state and county laws that prohibit the sale of liquor within their boundaries. It would seem that this is an unfair dealing on the part of the Federal Government and that the Federal license should be limited to states and counties having no prohibition laws.

THE SALOON AND THE MINER

The claim is frequently made, as in the article entitled "Prohibition from a Miner's Viewpoint," by an Ohio superintendent, July 17, p. 80, that "we have no right to deprive these [foreign] miners of their enjoyment in liquor drinking or their poor man's club—the saloon—unless we can give them in return something besides work that will take the place of these evils." While believing this to be true, I would ask, Should we keep up a practice, for the sake of the foreigner, that is sending hundreds of American miners to their graves? I would ask the advocates of saloons in mining towns if they would be willing to allow themselves to be lowered 200 or 300 ft. into a mine knowing that a drunken hand holds the throttle. There is but one answer to that question.

Again, why should we join in or permit a practice that not only renders the miner more subject to accident by blunting his sensibilities, but may even incapacitate members of the first-aid team and cause them to blunder at a critical moment? All will agree that it is dangerous to enter a mine, much less to work therein, except with every faculty alert and under control.

Attention has been drawn to the need of providing other diversions when removing the saloon—things that will take the place of the saloon for men who frequent those places. I will not attempt to say what kind of diversions will prove most successful. Much good has been done along this line by many coal companies and by the Y. M. C. A. extension work. I do not believe that either of these, however, has been as successful as the work deserves. The efforts of the company are almost invariably regarded by the miners as being prompted by a selfish desire to increase their own gains. Too often the miner considers that all mine officials, from the president to the assistant foreman, think of nothing but what has a dollar mark before it and involves a 99-per cent profit. This is a great mistake.

TWO INTERESTING INCIDENTS

I recall working for a superintendent who was thought to be one of the hardest-hearted men in the county. On one occasion a driver was caught between a car and the rib and severely injured. A little later the mine foreman and his assistants were summoned to the superintendent's office, where a conference was held to ascertain who was responsible for the accident. It was shown that the mine foreman had directed one of his assistants to widen this place, but he had neglected to do the work. The ex-

pected upbraiding of the assistant for this neglect did not come; but, instead, the superintendent said, "Boys, I want you to do two things in your daily rounds of the mine—first, keep away from strong drink and, second, give the miners all the protection that can possibly be provided, for I would rather see the tipple burn down than know that I was the cause of crippling a man or injuring his health." That little incident convinced me that mine officials have hearts like other men and that this hard-hearted superintendent fully realized the importance of his men keeping away from liquor.

I recall another instance where whisky was the cause of more trouble than all the liquor in the state was worth: The drivers in a certain mine decided they would not water their mules and brought up the matter at their union meeting. While the question was being discussed and the leaders were trying to get the matter settled, a big drunken bully came in and took part in the discussion. He told the men that they were weak-minded and afraid to strike, and after cussing the superintendent, stated that he would whip the first man who went down the next day. As a result a local strike was voted by the men, who were much surprised the next morning to see this bully enter the mine in his working clothes and equipped for work. On being threatened, later, he stated he did not know anything he had done at the meeting the night before; he did not remember going to the meeting, he was so drunk. I cite this incident to show the danger of strong drink in a mining community.

Injured by Accident When Drunk

In connection with this subject I want to ask, If a man is known to have been under the influence of liquor when he was killed or injured, would the company that employed him be responsible for the accident? I knew of a case of this kind that was thrown out of court by the judge, who refused to proceed when it was known that the injured man was under the influence of liquor at the time of the accident. Although a surprise to some, the action of the judge would seem to be fully warranted, as the injured man was in no condition for work at the time when the accident occurred.

I have always favored prohibition, especially in mining towns. The acts of a single drunken miner may not only cost him his own life, but may produce untold suffering and anguish for a large number of his fellow workers and those dependent on them. I believe, however, that our efforts are not exerted in the right direction. Instead of trying to stop the sale of liquor, we should endeavor to prevent its manufacture. I hope to live to see the d when this will be done. Ostel Bulloc

Bevier, Ky.

Study Course in Coal Mining

By J. T. Beard

The Coal Age Pocket Book

DENOMINATE NUMBERS

A **denominate number** is one expressed in units of a certain kind; as, for example, 5 days, 8 men, etc.

A **compound denominate number** is one expressed in two or more units; as 3 hr. 20 min., 8-ton mi., 4-acre-ft., etc. The terms ft. per sec., mi. per hr., rev. per min., etc., are all compound units.

An **abstract number** is any number not expressed in units of a kind; as 3, 5, 8, etc.

Kinds of Units—The principal kinds of units may be classed as follows:

1. Units of **weight;** as tons, pounds, ounces, grains, etc.
2. Units of **length** or distance; as miles, feet, inches, etc.
3. Units of **volume;** as cubic yards, cubic feet, etc.
4. Units of **capacity;** as gallons, quarts, pints, etc.
5. Units of **surface** or area; as square miles, square feet, etc.
6. Units of **time;** as years, months, days, hours, etc.
7. Units of **circular measure;** as degrees, minutes, etc.
8. Units of **currency;** as dollars, dimes, cents, etc.

WEIGHTS AND MEASURES

Systems in Use—There are two systems of weights and measures in general use, known as the "English, United States, or British," and the "French or metric" systems.

The **basis of comparison** of the English and French systems is expressed by the following established values:

Weight—The pound (7,000 grs.) is the same in the United States and Great Britain. The pound avoirdupois is equal to 453.5924277 grams in the French system.

Length—(United States) The length of the meter, by act of Congress, is 39.37 in. (Great Britain) The length of the meter, by act of Parliament, is 39.37079 in.

The slight difference in the length of the meter, as established by law in the United States and in Great Britain, makes the English inch and yard proportionally shorter than the same units in the United States.

Capacity—The gallon and liter are the accepted units of comparison in the English and French systems, respectively. The United States or "Winchester gallon," however, is quite different from the "Imperial gallon" of Great Britain, which was made the volume of 10 lb. of distilled water, at maximum density (4 deg. C.), weighed with brass weights in air at 62 deg. F., barometer 30 in.

Since 1 cu.in. pure water, under the same conditions, weighs 252.458 grs. and 1 lb. = 7,000 grs., the volume of the imperial gallon of Great Britain is

$$\frac{10 \times 700}{252.458} = 277.274 \text{ cu.in.}$$

The volume of the Winchester gallon of the United States is 231 cu.in. The French liter is the volume of 1 kg. of distilled water, at 4 deg. C., weighed in a vacuum, or 1000 c.c., which gives

Winchester gallon (United States), 231 cu.in. = 3.78543 liters.
Imperial gallon (Great Britain), 277.274 cu.in. = 4.54346 liters.

The Coal Age Pocket Book

UNITED STATES AND BRITISH SYSTEM

Following are the more useful of the tables of weights and measures in the English system:

AVOIRDUPOIS WEIGHT

		Equivalents
16 drams	= 1 ounce	437.5 grains
16 ounces	= 1 pound	7,000 grains
28 pounds	= 1 quarter	448 ounces
4 quarters	= 1 hundredweight	112 pounds
20 hundredweight	= 1 long ton	2,240 pounds
Or, 25 pounds	= 1 quarter	400 ounces
4 quarters	= 1 hundredweight	100 pounds
20 hundredweight	= 1 short ton	2,000 pounds

The short ton (2,000 lb.) is more generally used in the United States.

TROY WEIGHT

24 grains	= 1 pennyweight	
20 pennyweights	= 1 ounce	480 grains
12 ounces	= 1 pound	5,760 grains

APOTHECARIES WEIGHT

20 grains	= 1 scruple	
3 scruples	= 1 dram	60 grains
8 drams	= 1 ounce	480 grains
12 ounces	= 1 pound	5,760 grains

The grain (Troy) is the same as the grain (apothecaries) and is the basis of comparison of these and avoirdupois weights. Thus,

1 lb. avoirdupois = 7,000/5,760 = 1.21528 lb. troy.
1 lb. troy = 5,760/7,000 = 0.822857 lb. avoirdupois.
1 oz. avoirdupois = 437.5/480 = 0.911458 oz. troy.
1 oz. troy = 480/437.5 = 1.097143 oz. avoirdupois.

LONG MEASURE

12	inches	= 1 foot	
3	feet	= 1 yard	36 inches
5½	yards	= 1 rod, perch, or pole	16½ feet
40	rods	= 1 furlong	660 feet
8	furlongs	= 1 mile	5,280 feet
3	miles	= 1 league	

The old surveyor's chain of 100 links (1 link = 7.92 in.) was 66 ft. long, making 80 chains = 1 mi. Chains now in common use are 50,100 and 300 ft. long, made up of 1-ft. links.

A fathom is 6 ft. or 2 yd., used in estimating depth.

SQUARE MEASURE

144	square inches	= 1 square foot
9	square feet	= 1 square yard
30¼	square yards	= 1 square rod
40	square rods	= 1 rood
4	roods	= 1 acre
640	acres	= 1 square mile

An acre contains 43,560 sq.ft. and measures 208.7 ft. on each side; $\sqrt{43,560} = 208.7$ ft.

Inquiries of General Interest

Handling Cars on Pitches

We are working a low seam of coal where the pitch is too great to allow the cars to be handled by hand and the seam is too low to permit mules to enter the rooms without brushing the roof over the road, which would entail too great an expense. The pitch of the seam is not sufficiently great to make the coal slide even when sheet iron is used in the chutes.

I have been informed that this seam can be worked most economically by employing a double-track gravity system in the rooms. As I am not familiar with this system of mining, will you kindly explain the method in detail? I will say that we are working under a fairly good roof, which will permit the use of the double track in the rooms if such a system is practicable. I would much appreciate, also, hearing from others who have had experience in working coal with such a system.

MINE SUPERINTENDENT.

——, Wash.

Before answering this interesting question, which we hope will lead to much practical discussion, it will be well to state the average grade limits for the different methods or systems of handling cars in rooms. The limit of grade on which cars can be handled economically and with safety is considerably modified by both the condition of the track and the rolling stock. Where the bottom is a soft fireclay, the track in the rooms often becomes very slippery. Again, where wood instead of iron rails are used in the rooms, the cars can be handled on a steeper pitch.

Following are the different systems in use for handling cars in the rooms, together with their average grade limits:

Cars handled by hand	Level— 6°
Cars lowered and hoisted by windlass	5°—10°
Self-acting incline	5°—15°
Gravity plane with barney	10°—30°
Buggy system in thick seams	10°—18°
Chutes lined with sheet iron (anthracite)	15°—30°
Chutes in natural formation (anthracite)	30°—up

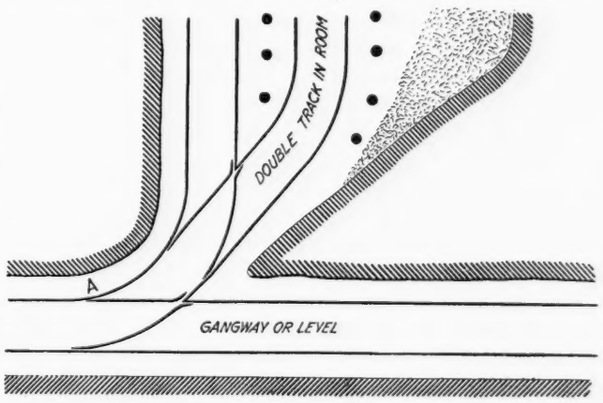
By adopting the alternative of driving the rooms at an angle with the gangway or level, it is possible to reduce the percentage of grade so that the grade limits mentioned above will apply to seams of steeper inclination. In this case, calling the angle of inclination of the seam the "dip angle" and the percentage of grade of the track the "grade angle," the ratio of the tangent of the grade angle to the tangent of the dip angle is equal to the sine of the angle the road makes with the gangway, measured in a horizontal plane. Calling the angle between the rooms and the gangway A, this relation is expressed by the formula

$$\sin A = \frac{\tan \text{ grade angle}}{\tan \text{ dip angle}}$$

For practical reasons, the angle between the rooms and the gangway is seldom less than 45 deg. For this angle (45 deg.) the tangent of the grade angle, or the percentage of grade, is seven-tenths of the tangent of the dip angle.

The system referred to by correspondent is illustrated in the accompanying figure, which shows the switch on the gangway as having fixed points, while that at the mouth of the room, for the double track, has movable points that are operated by the loaded car as it passes down to the gangway, leaving the switch set for the return of the ascending empty car on the same track.

In this system both the empty and the loaded cars are attached to a steel ¼- or ½-in. cable. One end of this cable is made fast by a clevis and pin to the loaded car. The cable passes over a 12- or 14-in. sheave or grooved wheel at the head of the incline and then down the other track, where it is made fast to the empty car standing on the gangway. In order to avoid the frequent splicing of the cable as the face of the room is advanced and a greater



PLAN SHOWING ARRANGEMENT OF SWITCHES FOR DOUBLE-TRACK INCLINE IN ROOM

length of cable is required, the latter is made longer and the surplus length bound in a coil, which is laid on top of the car.

The system is a gravity system, or a self-acting incline, in which the descending loaded car draws up the ascending empty. The movement of the cars is controlled by a heavy brake stick, which is inserted between the groove of the sheave at the head of the incline and the clevis by which this sheave is made fast to the post, the clevis acting as a fulcrum for this improvised brake.

The post to which the head-sheave is attached, by means of a short length of chain or cable and a suitable clevis, is set in hitches cut in the roof and floor of the seam. As the face of the room is advanced, this post is moved up the pitch, and the cable supporting the cars is then lengthened by unwinding the coil previously mentioned. The pull of the cable on the empty car as it starts off the gangway is sufficient to cause this car to take the switch. The follower rail of the main track, marked A in the figure, is made slightly higher than the other rail of this track so that cars on the main line will not take the switch.

Examination Questions

Recent Iowa Examinations for Hoisting Engineers

(Selected Questions)

Ques.—(*a*) What is steam and how is it produced? (*b*) What is meant by high-pressure and what is low-pressure steam?

Ans.—(*a*) Steam is water vapor produced by evaporation of the water. Evaporation takes place at all temperatures, but is facilitated by the application of heat, causing an increase of temperature; also by a decrease of pressure. Under normal atmospheric pressure at sea level (14.7 lb. per sq.in.), pure water boils and steam is formed at a temperature of 212 deg. F. In the production of steam in a boiler, for power purposes, the temperature at which vaporization takes place increases with the pressure.

(*b*) There is no point of the gage that marks the distinction between low-pressure and high-pressure steam. For heating purposes, low-pressure steam is used, the pressure not exceeding 10 lb. per sq.in. For power purposes, perhaps the best answer that can be given to this question is to say that low-pressure steam is steam that has undergone one or more expansions, as in the case of the steam entering the low-pressure cylinder of a compound engine. On the other hand, high-pressure steam may be understood as referring to steam that enters the cylinder of the engine at or near boiler pressure.

Ques.—(*a*) In what respect is a flue boiler different from a tubular boiler? (*b*) Which is the more economical, and why?

Ans.—(*a*) The difference between these two types of boilers consists chiefly in the size and number of the flues or tubes. All tubes through which the flame and gases of the furnace pass on their way to the stack are properly flues, but the term "tube" is generally applied to drawn or lap-welded tubes, while the term "flue" is used in respect to a built-up flue.

(*b*) The tubular type of boiler is the more economical, because it presents a larger heating surface for the same grate area and gives a greater evaporation of steam per pound of fuel burned.

Ques.—What is the horsepower of a horizontal tubular boiler 5 ft. in diameter, 18 ft. long, containing seventy 3-in. tubes?

Ans.—The horsepower of this type of boiler is commonly estimated as varying from $^1/_{18}$ to $^1/_{14}$ of its heating surface. Assuming that three-fifths of the shell and ends of the boiler is exposed to the flame and hot gases of the furnace, the total heating surface of the two boiler heads, less the area that must be deducted for the seventy 3-in. tubes, is

$$2 \times 0.7854\ (^3/_5 \times 60^2 - 70 \times 3^2) \div 144 = 16.7\ sq.ft.$$

The combined area of three-fifths of the shell, which is 60 in. in diameter, and the cylindrical surface of the seventy 3-in. tubes is

$$3.1416(^3/_5 \times 60 + 70 \times 3)18 \div 12 = 1159.3\ sq.ft.$$

The total heating surface is therefore 1,176 sq.ft. Then, assuming the average ratio of heating surface to horsepower as 16, the horsepower of this boiler is 1,176 ÷ 16 = 73.5, say, 75 hp.

Ques.—An engine cylinder is 12 in. in diameter and 18 in. long. Find the sectional area and the cubic contents of this cylinder.

Ans.—The sectional area is $0.7854 \times 12^2 = 113.1$ sq.in. The cubic contents of the cylinder is therefore $113.1 \times 18 = 2{,}035.8$ cu.in.

Ques.—In case of imminent danger, supposing the water had fallen below the water gage or the pressure had become dangerously high in a boiler of which you had charge, what would you do?

Ans.—In case the water has fallen below the gage or glass and does not appear in the lowest trycock, open the furnace door and dampen the fire with a few shovelfuls of green coal or ashes. Do not disturb the fire, as this would only increase the heat of the furnace and make the danger the greater.

A dangerously high pressure could only result by the sticking of the safety valve. It is not generally considered well, in that case, to force the safety valve open suddenly. Every effort should be made to reduce the pressure by starting the engine or allowing the escape of steam by any means available. As easily as possible, the safety valve should be released.

Ques.—A boiler is to be run under a pressure of 100 lb. per sq.in.; to what hydrostatic pressure ought this to be tested for safety?

Ans.—The rules of different underwriters vary in regard to the hydrostatic test of boilers. The pressure to which the boiler should be subjected in this test will depend to some extent on the factor of safety used in its manufacture as well as the service for which it is designed. The hydrostatic pressure is sometimes made twice the working pressure of the boiler. At other times a hydrostatic pressure half again as great as the working pressure is employed, and again the hydrostatic pressure when testing a boiler is increased from 80 to 100 lb. above the working pressure.

Ques.—What is piston displacement, and how is it measured?

Ans.—Piston displacement, in engine practice, is the volume of the space passed through by the piston when making a single stroke. It is measured by the product of the sectional area of the cylinder and the length of the stroke.

Ques.—Name and define four important events in the distribution of steam which occur in every revolution of an engine.

Ans.—The four important points in the cycle of a steam engine are the point of admission when the steam port begins to open; the point of cutoff when the steam port is closed to the admission of steam; the point of release determined by the opening of the exhaust port; and the point of compression, which begins with the closing of the exhaust port.

Coal and Coke News

Harrisburg, Penn.

Millions of dollars are at stake in an equity suit now before Judge C. N. Brum at Pottsville.

It is a suit to prevent the board of city trusts of Philadelphia, which has leased the Girard estate coal lands under the city of Shenandoah to the Thomas Colliery Co., from removing the pillars which now hold up considerable of the real estate of Shenandoah.

Half a million tons of coal are in the pillars, the market value being considerable more than $1,000,000. But the safety of several millions of dollars in real estate also hinges on the case. The Home Brewing Co., is the complainant in the case and Archbishop Predergast has also secured leave to intervene, because St. Casimer's Catholic Church valued at $80,000 is in the danger zone and may be affected if the pillars are removed.

The court is called upon to decide whether the mining company shall be made to suffer by reason of prohibition against the removal of the remaining pillars of coal, or whether the surface property owners shall be compelled to run the risk of great damage.

The action is similar to those taken in Scranton and Wilkes-Barre, differing only in detail. The leading question is whether reservation to a mining company which has bought or leased coal and has obligated itself to pay for it, are in the nature of an inviolable contract when mining is conducted in such a way as to imperil life and also vast property interest. The Supreme Court has already decided that where stipulations in a deed are clear, surface property owners have no redress, and that even risk of life cannot be taken into account in a suit to annul a company's right to take out as much coal as it pleases.

In this connection the Supreme Court has said that "Where one person owns the surface and another person owns the coal or materials lying underneath, the under mineral estates owes a servitude of sufficient support to the upper or superincumbent estate. This principle has no application where the same person is the owner of both estates, nor does it apply where by contract between the parties they have covenanted for a different rule. Like any other right, the owner of the surface may part with the right to support, by his deed or covenant.

"Where a conveyance of surface reserves to the grantor the right 'to mine and take away the coal without making any compensation to the grantee, his heirs or assigns, for any effect upon, or injury to the said lot or piece of ground, or the surface thereof, or to the buildings being on the surface thereof, or to the buildings erected thereon in consequence of mining,' the grantee has no right to surface support, and cannot recover for failure to support, even if that has been caused by negligent mining."

Owners and lessees of coal have been so well fortified by the above decision that they contend that the only safeguard is some arrangement with them by which owners of surface property will pay then for the coal that should be left standing. This was, in substance, the principal recommendation made by the Cave-in Commission appointed by Governor Tener several years ago.

It is evident that the only hope of surface owners is that by some extension of the police powers of the state, not yet tried out in litigation, relief may be afforded them, on the ground that no private contract should jeopardize life. There is some hope of securing relief through a municipality's control over public streets and buildings. Along these lines litigation has not yet been carried to the higher courts. The outcome of the suits at Pottsville will be awaited with the keenest interest by the entire anthracite region.

PENNSYLVANIA

Anthracite

Pottsville—The Supreme Court has decided that the office of Mine Inspector is a state position, and candidates must therefore be elected in the even numbered years and not the odd numbered. Accordingly the names of Archie B. Lamb, of Shenandoah, and P. J. Fenton, of Mahanoy City, have been stricken from the ballot. All nominations for this office are now valueless.

Pittston—Something of a novelty was introduced at a recent meeting of the Pittston Mining Institute, at which Mine Inspector Samuel J. Jennings gave an address on "The Practical and Economical Use of Timber at the Mine Face." Demonstrations were given by the use of a wagon-load of mine timber which had been placed on the stage of the meeting room.

Scranton—Three homes on Beech St. were badly damaged by a cave-in of the National mine of the Lackawanna Coal Co. recently. Two of the houses were not in use, the occupants having removed on warning from the company to do so. The other house was badly wrecked, while the two above mentioned were tilted entirely from their foundations.

Shenandoah—The collieries of this region, which have been on a three days a week schedule for several months, have now gone on full time. This is the first time the mines have worked full time since last December.

Hazleton—Of late it has been quite noticeable that the number of miners who desert the mines for the farm is on the increase. Especially is this true of the foreigners who come from agrarian districts in their native land. As soon as they can accumulate sufficient money in the mines to buy a small farm they lay down their tools. The Rush and Quakake valleys in this county are dotted with the farms of the former miners. These men accustomed in the home country, where land is scarce to till the soil up to the very doorstep, are making a success of what have been termed hereabouts worn-out farms.

McDonaldtown—Officials of the Brothers Valley Coal Co. were forced to close down part of their plant at this place on Oct. 14, because of a car famine. It was found impossible to get cars into McDonaldtown. All the available rolling stock had been filled the night before. The car famine comes at a bad time, as the Brothers Valley company has a number of orders which require immediate shipment.

Bituminous

Johnstown—Coal operators in this part of the bituminous field are not seeking war orders to any great extent, but say they have received numerous inquiries of late from Italy and Spain, as well as from South America. One of the chief objections to the foreign orders is said to be that buyers in both Europe and South America expect the shipper to pay the freight and insurance, while the American method has always been to charge the freight to the consignee. Foreign buyers also specify that the coal shall contain no sulphur, and shall be high in volatile matter, conditions which are said to be difficult to meet in this part of the bituminous field. There appears to be a general feeling among the coal men also, that any business gained now in foreign fields will be lost immediately on the conclusion of the war. Some foreign orders have been placed, but they are limited in quantity, and the fields which they affect are not large.

Uniontown—Without a car of holdover coke in the region and agents applying daily for contracts at present rates, coke producers of Fayette county are on the qui vive, anticipating one of the greatest demands for their fuel that has ever been known and at prices which will make up for some of the hard times since 1907. New plants are being fired and old plants, idle from 6 months to two years, are cleaned up and ready to start when the directors give the word. The Emery plant of the South Fayette Coke Co. is running full. Sometime within the next few days the Newcomer Coke Co., will begin operations at its new plant near McClure Station and both the Gilmore and Plumer coke companies are ready to operate at a few hours notice. The former has 102 and the latter 72 ovens available.

Announcement was recently made by the H. C. Frick Coke Co. that 500 additional ovens were fired recently at Bitner, which plant has been idle for more than a year; 200 to 300 ovens have been blown in; 750 additional ovens will be fired at 18 plants shortly, bringing the output of this company to a 90% capacity. The plants affected are Adelaide, Brinkerton, Buffinton, Calumet, Continental, Continental No. 2 Continental No. 3. Dorothy, Hecla, Kyle, Marguerite, Standard, United, York Run, Hostetter, Whitney, Leisenring No. 2, Le Monte and Bitner.

Connellsville—An increase of 20,000 tons per week recently brought the production of the Connellsville region to 418,000 tons. This is the greatest output since the first quarter of 1913.

According to reports the H. C. Frick Coke Co., is still continuing in its efforts to extract valuable products from the sulphurous water pumped from its many mines in western Pennsylvania. The latest attempt is at the Calumet plant near Mount Pleasant where the sulphur-laden water is pumped into a large tank where a churning process is constantly going on, and from whence it will pass through machinery designed to separate the byproducts from the water. These consist of iron oxide, sulphur and other minerals.

MARYLAND

Baltimore—It is stated that the Consolidation Coal Co., since Jan. 1, has mined and shipped coal at the rate of 1,000,000 tons per month. Since Aug. 1 the Consolidation Co. has exported hundreds of thousands of tons of fuel. There now exists a shortage of cars and men, the first being due largely to increased manufacture, while the second is the result of the European war.

VIRGINIA

Big Stone Gap—The coke plant of southwest Virginia are being put in shape for active operations, and it is believed that all of the ovens will be in blast by the first of the year. The most serious problem which the producers have to face is that of labor.

WEST VIRGINIA

Moundsville—As soon as the special receiver was appointed for the Mound City Coal Co., men were put to work cleaning up the mine ready to start operations. It is hoped that this mine will run steadily with a considerable number of men. The Dollar Saving and Trust Co. of Wheeling is the special receiver.

Within the next few days work will be started to increase the capacity of the railroad switch at the Rail and River coal mine No. 3 at Big Run, near this city. The present switch has a capacity of about 22 gondolas, the additions will give a capacity of about 50 cars, so that the mine can be worked full time whenever orders for the entire output can be secured.

Charleston—It is reported by the Department of Mines that 13 out of the 32 fatalities due to accidents occurring in in the mines of West Virginia during September took place in McDowell County. Of the remaining 19 fatalities four occurred in Fayette County, five in Raleigh, two each in Harrison and Logan counties, and one each in Brooke, Marion, Mercer, Mingo, Ohio and Tucker counties. Ninteen deaths were due to falls of slate and coal. Mine cars killed six men, locomotive, two, electricity, three, and monitors, one.

Pocahontas—It is estimated that the Pocahontas field has been affected less through foreigners answering the call to arms in Europe than any other coal field of the state. It is said that throughout the Pocahontas field virtually no shortage of labor exists, while this has become a serious problem in some of the other coal fields.

OHIO

Bellaire—The Lansing mine of the Lorain Coal and Dock Co. started work recently after being idle for 19 months. When working full this mine employed 400 men, about half that number being now at work.

Cincinnati—Members of the Ohio Coal Operators' Association have been informed of the decision of four railroads handling coal shipments from south of the Ohio river to increase the differential in favor of Ohio, in order to meet the objection of the Ohio men that they could not compete with West Virginia and Kentucky coal in the markets of the West and Northwest. The railroads affected include the Chesapeake & Ohio, the Louisville & Nashville, the Baltimore & Ohio and the Queen & Crescent.

INDIANA

Linton—Operations have been resumed at the Little Giant mine after several weeks' idleness. Three hundred men are employed.

Columbus—The Columbus Chamber of Commerce has filed a petition with the public service commission at Indianapolis against railroads connecting the Columbus territory with the coal fields of Indiana in which it is declared that discriminatory rates on coal to Columbus manufacturers has kept many of them from making needed extensions to their factory properties, even though the stimulus of the European war has been felt in many industries there. The commission is asked to make an order reducing and equalizing rates on coal for manufacturing purposes. The Central Indiana Ry. Co., Chicago, Terre Haute & Southeastern R.R., Cleveland, Cincinnati, Chicago & St. Louis, the Illinois Central, Lake Erie & Western, Pittsburg, Cincinnati, Chicago & St. Louis and the Vandalia railroads are complained of in the petition.

Sullivan—Joseph Weatherly, fire boss at the Peerless mine, has invented a roof support for entries and air courses. By his plan, coal is overcut by an adaptation of the topcutting mining machine, arranged to form a curved kerf at the elevation of the roof. When the coal below the kerf is removed, that above it forms a roof-supporting arch of sufficient depth at the ribs to hold the overlying stratum and with enough thickness at the middle to protect the slate from air slacking.

ILLINOIS

Witt—The three large coal mines at this place were closed Oct. 13 for an indefinite period, throwing 600 men out of work. Many of the miners are preparing to leave here and seek homes and work elsewhere.

Springfield—Every 320,000 tons of coal mined in Illinois for the year ending June 30, 1915, cost one life, according to the report of the Illinois Mining Board. One hundred and eighty men were killed while employed about the mines. Of these 176 met death underground. Serious injuries totaled 1013. A total of 75,607 men were employed in the 779 coal mines of the state. These mines produced 57,601,694 tons, of which 56,173,176 tons came from 281 shipping or commercial mines. The number of mines in operation was 16 less than the previous year. One hundred and twenty-three new mines were opened during the year and 139 were closed or abandoned. Of the output 11,100,890 tons was delivered to locomotives at the mines, 41,461,218 tons was shipped and 2,000,000 tons was used or wasted at the mines. Five hundred and eighty-two motors and 1,708 machines were in operation and the machine-cut coal totaled 34,037,426 tons against 23,564,268 tons mined by hand. The average price paid per gross ton for hand mining was $0.52. To blast this coal 1,106,786 kegs of powder were used.

Mt. Olive—Operators of the standard field in Illinois are no longer required to shut down on "Virden day" or pay a fine. Annual memorial services for the four men killed in a strike riot at Virden 15 years ago this month are still held by the miners, but the prohibition against work on that day in the inner group of mines has been lifted.

IOWA

Des Moines—With the advent of frosty weather the coal mines in and about Des Moines are putting on larger forces of men and within another 4 to 6 weeks, will be running full capacity. According to reports coming in to the state mine inspector's office, all of the mines in the state are taking on more men.

Notwithstanding the fact that its mines are being worked out and the consumption of coal is increasing, Iowa has enough coal to last 2,500 years, according to geology experts. Mr. Campbell of the Geological Survey has estimated that the original coal supply of Iowa was 29,160,000,000 tons. From 1840 to June 30, 1914, the amount of coal mined in the state, according to the records of the state mine inspector's office, was 182,612,952 tons.

COLORADO

Denver—Owing to the fact that there promises to be a steady growth in the buying of soft coal for export, soft coal conditions in Colorado have already reached a point 100 per cent. above normal. Colorado coal will probably not be exported to any extent, but domestic markets which may be reached from this point will be fed from Colorado.

WYOMING

Kemmerer—It is stated that the Cumberland Mines now have an output of about 2,000 tons per day with 400 men on the payroll. Prospecting has been carried on for some time past on the west crop of the Cumberland seam, some distance from the present mine. It is understood that the prospects in Uinta County are sufficient to warrant the company in opening a new mine, and a force of men will shortly be put to work driving a slope. This will be on an 8-ft. bed of the same coal as is now being worked.

FOREIGN NEWS

Toronto, Ont.—A receiver and manager of the Inverness Ry. and Coal Co., of Nova Scotia, has been appointed by the court on the application of the National Trust Co., Ltd., trustees for the bondholders. This action was recently de-

cided upon at a meeting of the bondholders at which 50% of the outstanding bonds were represented. A bondholder's committee was appointed to advise the trustees respecting any matters which may arise in connection with the receivership. It is expected that the operations of the company will meet working expenses during the continuance of the receivership.

PERSONALS

Lyell Buttermore, payroll clerk at the Coldbrook plant of the H. C. Frick Coke Co., has been transferred to a similar position at Bitner.

B. C. Price, of Kingston, Penn., for 26 years an employee of the Lehigh Valley Coal Co., has resigned his position as chief clerk of the Wyoming division, to accept a position with the Hudson Coal Co. as chief accountant for the Wilkes-Barre division.

P. J. Rogers, president of the Alabama state convict board is visiting the coal producing counties of the state to familiarize himself with coal mining, as he is planning to work state convicts in the development of coal lands owned by the University of Alabama at Tuscaloosa.

Earle A. Henry, chief of the West Virginia Department of Mines, recently conducted examinations at Mt. Hope, where 76 men were examined for the positions of mine foremen and firebosses. Fifty-two of this number were given practical gas tests in a mine as part of their examination work.

James Cole Roberts, mining engineer in charge of the United States Bureau of Mines at Denver, Colo., has resigned that position to accept the professorship of the newly created chair of Safety and Efficiency Engineering at the University of Colorado, at Golden, Colo. He will assume the duties of his new position about Nov. 15. His successor with the Bureau has not been named.

Thomas E. Ashman, veteran coal miner of Des Moines, Ia., has just inherited $80,000 from a distant relative, of whose existence he was never aware, but is still working in the mines. Ashman received the good news calmly. He has a wife and one daughter and is paying for a home in monthly installments. He is one of three heirs to the estate of a Mr. Belinsky, Russian banker, who died recently in England leaving a fortune of £48,000.

Henry T. Bardeleben, president of the W. G. Coyle Coal Co., of New Orleans, has signed an order giving 15 days' extra pay to every employee of the company. The bonus is for the splendid services performed by the employees during the hurricane that struck the port Sept. 29. The company's loss in the storm was virtually $30,000; but would have been much more had it not been for the courage and coolheadedness of a number of the company's employees.

OBITUARY

Charles Klepser, a mining engineer 25 years of age, was killed on Oct. 15 by a fall of coal in a mine at Portage, Cambria County, Penn.

Harry W. Errett, 46 years of age, secretary and treasurer of the Troll Coal Co., of St. Clairsville, Ohio, died recently at his home in that city.

Joshua William Alder, well known in the coal trade of the country and for years engaged in the publication of maps and compilation of statistics relating to the coal industry, died recently in Muncy, Penn. at the age of 84 years.

Enoch Garver, aged 60, a mine inspector, died Oct. 18, in a hospital in Charleston, W. Va., as a result of injuries received in the Sunday Creek Coal Co.'s mine at Longacre some time before when a coal car jumped the track crushing him against the rib.

James Kennedy, a member of the Miners' Certificate Examining Board died in Pottsville, Penn., recently after a lingering illness. He was formerly a fire boss at the Blackwood colliery and was prominent in mining circles throughout the region. He was 48 years of age.

W. H. Motter, of Denver, Colo., a man who is well known as a successful inventor of mining machinery died recently at the home of his daughter Mrs. T. P. McAndries after a short illness. He was a veteran of the civil war and a member of the Grand Army of the Republic. He leaves a large circle of friends.

John J. Doherty, a well-known mine foreman, died at his home recently at Latrobe, Penn. For three years Mr. Doherty has suffered from cancer, but prior to his retirement from active life he was connected with a number of coal mines in that section. Mr. Doherty was 51 years of age, and is survived by four children.

INDUSTRIAL NEWS

Des Moines, Iowa—The Maple Block Co. is opening a new field on the Addison Parker farm, north of Des Moines.

Pittsburgh, Penn.—The Consolidated Coke Co. of Uniontown has absorbed the Pickands-Magee Co. of Pittsburgh.

Gadsden, Ala—It is reported that the Gulf States Steel Co. will spend in the near future approximately one million dollars in improvements and additions to its plant.

Boswell, Penn.—One of the most valuable coal tracts in Somerset County known as the George Reiman tract located in Jenner Township has been sold to the United Coal Co. This tract contains 128 acres of coal.

Whitesburg, Ky.—It is announced that the Mineral Development Co., of Philadelphia, will make two coal developments along Colly Creek a few miles above this city, the initial work to start within the next 60 days.

Charleston, W. Va.—A deed was recently recorded showing the transfer of somewhat over 1,000 acres of coal land on Cabin Creek in Kanawha County, from the Williams Coal Co. and the Cabin Creek Kanawha Coal Co. to the Shonk Land Co.

Cresson, Penn.—It is stated that due to the general increase in business, a number of mines in this section which have been idle for more than a year are now being put into condition to be operated to full capacity. Other mines now operated will be speeded up to fill orders now coming in.

Cincinnati, Ohio—The United States Circuit Court of Appeals has decided against the Marmet Coal Co. in its appeal against a judgment in favor of the People's Coal Co., of Pittsburg, for $12,000 as balance of the purchase price due on 55 coal barges purchased by the Marmet company in May, 1911.

Washington, D. C.—Tariffs of the Central R.R. Co. of New Jersey, proposing payment of allowances to the Lehigh Coal and Navigation Co. out of its freight rates on anthracite coal from Hauto and Nesquehoning, were recently ordered canceled by the Interstate Commerce Commission. Such allowances were held to be unlawful by that body.

Pittsburgh, Penn.—It has been reported that a resurvey of the property of the Pittsburgh Coal Co. has been made and that most of the stock recently bought has gone into the hands of affiliations of the Midvale Steel Co. It is said that the Pittsburgh Coal Co. will henceforth be closely connected with the Midvale Steel Corporation even though it is not actually absorbed thereby.

St. Louis, Mo.—The meeting of the St. Louis Coal Club which was to have been held Oct. 18 has been postponed to Oct. 25. The principal speaker of the evening will be C. N. Talbert, director of streets and sewers. He will tell the coal men what his department has to contend with on account of overloaded coal wagons, etc.

Chester, Miss.—It is said that in the vicinity of Reform some 12 miles north of this place, a coal measure has been found, and it is believed that mining upon a more or less extensive scale will be attempted before the end of the present year. A coal company has been formed, and various purchases and leases made.

Clearfield, Penn.—H. P. Dowler has purchased the Fayette Coal Co.'s mining plant and property at Dola, W. Va. This property consists of approximately 1,250,000 tons of coal in the seam and a well equipped mining plant. It is the intention of the purchaser to improve the property and operate with an output of 1,000 tons per day.

Springfield, Ill.—The Public Utilities Commission of Illinois took up recently the complaint of the Southern Coal, Coke & Mining Co. against the Vandalia and Southern railways companies. The complaint is based on the refusal of the Vandalia to establish through routes and joint rates on coal from the mines on the Southern Railway to points on the Vandalia line.

Waynesburg, Penn.—Large payments on Green County coal acreage were recently made in Waynesburg by the Cleveland Cliffs Iron Co., of Cleveland, Ohio. Three mortgages for $90,000, $12,000 and $235,000 were satisfied. These were respectively to Mrs. Mary Hawkins, Sarah McClenathan, and

Rex Moredock, of Jefferson, and to J. V. Thompson and associates of Uniontown.

Belaire, Ohio—It is stated that the George M. Jones Coal Co. will probably construct a new tipple for its pultney mine unless plans can be devised to equip the old one with proper scales and machinery. While the new tipple is being erected, the miners employed at Pultney will be transferred to the Webb mine which in the meantime will be placed in shape to resume operation.

Youngstown, Ohio—The American Tar Products Co., which operates a plant at Crab Creek, Ohio, has completed negotiations with the Republic Iron and Steel Co. for the tar products from the new by-product ovens of the latter company, 75 in number, which will be completed in a few days. The tar products company may have to extend its plant in order to take care of the new material.

Birmingham, Ala.—Owing to the improved pig-iron market, several of the largest iron producers of the district are repairing and will soon put into blast additional furnaces. The present price is the best obtained for several years, and the make for September was the largest in the same length of time. Stocks on hand are being rapidly reduced and it will be necessary to put additional furnaces into blast to take care of orders.

Cincinnati, Ohio—The Ulland Coal Co. has filed a complaint with the Interstate Commerce Commission claiming reparation from the Louisville and Nashville R.R. Co. on numerous coal shipments from Kentucky and Tennessee mines to the company's Hunt St. station in Cincinnati. It is claimed that the revision of Apr. 15 advanced the rate to an unreasonable extent as compared with other points in the Cincinnati district.

Philadelphia, Penn.—This port continues to show a big increase in coal shipments over the piers. For the period of nine months ending Sept. 30 there were 792,600 tons of bituminous coal loaded as compared with 480,336 for the same period last year. The anthracite tonnage also showed a good increase with 51,583 tons as against 41,861 tons. The total value of all shipments is placed at $2,705,115, compared with $1,571,293 last year.

Birmingham, Ala.—C. H. Nesbitt, state mine inspector, asserts that the coal production in the state during the present year may be 16,000,000 tons, and may even go higher. The output from the larger mines to supply the metal industries has brought the figures up to this satisfactory output. There is agood demand for coke, and the starting of a number of beehive coke ovens shortly will mean a further need for coal before the end of the year.

Philadelphia, Penn.—The Philadelphia and Reading Ry. coal barges "Tunnel Ridge" and "Coleraine," which foundered in a storm off Provincetown, Mass., recently have been stripped of their fittings and the hulls burned, so as to remove the possibility of their becoming a menace to navigation, as it was declared impossible to float them. The "Manheim," which went ashore at the same time, is in such a position that it is thought likely to float her.

Denver, Colo—It was rumored in Denver that the corporation of E. I. Du Pont de Nemours & Co., whose domicile is in Delaware, has obtained an option on the common stock of the Colorado Fuel and Iron Co. It was further said that the Pueblo plant of the Colorado Fuel and Iron Co. would be turned into an ammunition factory, in conjunction with the Midvale Steel Co., which the Du Ponts and W. E. Carey are said to have just acquired. The rumor has been denied.

Wheeling, W. Va.—Attachments for sums aggregating $49,233 and covering 11,450 acres of coal lands near here have been filed against J. V. Thompson, of Uniontown, Penn., whose affairs have been in litigation for nearly a year, following the closing of the First National Bank of Uniontown. The attachments were filed on behalf of William T. George, J. R. Barnes, Robert E. Umbel, John Brown and Samuel Woodward, all of whom allege that they hold notes against Thompson.

Belleville, Ill.—R. W. Ropiequet, attorney for the St. Louis Coal Traffic Bureau, has filed with the Public Utilities Commission of Illinois a petition for a rehearing in the Illinois coal rate case which was recently passed on by the commission. The railroads were permitted by the commission to put into effect a new coal rate into the East St. Louis market, increasing the rate from 32c. to 37½c. a ton. The rate had been suspended for several months while the operators and the City of Belleville tried to have the suspension made permanent.

Birmingham, Ala.—The first shipment of coal to be made by barges on the Warrior River by the De Bardeleben Coal Co. was recently loaded at Cardova. There are now three large companies using the Warrior for barging coal to Mobile and New Orleans. The Tennessee Coal, Iron and R.R. Co. is shipping 10,000 tons of coal per month to New Orleans. The Pratt Consolidated Coal Co. ships more than a thousand tons per week, and the De Bardeleben Co. has a contract to furnish the United Fruit Co. at Mobile with 40,000 tons of coal during the present fiscal year.

Clearfield, Penn.—The Pennsylvania Public Service Commission has issued an order dividing between interested railroads the revenues for hauling coke from the Gallitzin, Connellsville, Clearfield and other fields to the plants of the Lehigh Fire Brick Works, Bryden Horse Shoe Co. and the Crane Iron Works at Catasauqua. The case was heard last winter and attracted wide attention because of the questions involved. The new order decides that the Lehigh and New England R.R. shall receive 33c. out of the revenue on each ton of coke and the Pennsylvania and Lehigh Valley railroads will receive the balance.

Columbus, Ohio—The Chesapeake & Northern Ohio Ry. Co. has asked the Public Utilities Commission for authority to increase its capital stock from $50,000 to $3,450,000 and to issue $1,000,000, 5 per cent. 30-year gold bonds. Proceeds from the sale of the securities are to be used in taking up present floating indebtedness. The company reported that in building its new line from Portsmouth to Columbus it has already spent $1,354,000 and expects to spend $3,264,000 additional to complete the line. The Hocking Valley Ry. also applied to the Utilities Commission for permission to issue $4,000,000, 2-year 5-per cent. gold notes to refund an equal amount of 6-per cent. notes, due Nov. 1.

Denver, Colo.—A suit has been filed with the state public utility commission by the Grand Junction Mining and Fuel Co. and also by the Palisade Coal and Supply Co. to compel the Denver and Rio Grande R.R. to give better rates in Mesa County, Colorado, where the railroad carries coal from the Cameo mines. They also attempt to force the railroads to make a publication of tariffs for coal rates from Denver to Salida. The petitioners allege that the rates are unfair and unjust and that furthermore the rates charged from Bowie, Somerset and Crested Butte and from Thompson, Utah, are so heavy that it is impossible to compete for the business of Denver or other cities in eastern or central Colorado.

Cincinnati, Ohio—The annual meeting of the Kanawha Coal Operators' Association, of West Virginia, was held here on Oct. 15, one of the chief matters of business taken up being that of the proposed change in rates from West Virginia mining points to the West. The association determined to engage counsel to appear before the Interstate Commerce Commission on its behalf, together with counsel for other West Virginia operators. No action will be taken, however, until the proposed rates are filed to become effective. Col. E. O. Dana, of Cincinnati, was reëlected president of the association, T. J. Hatfield, of Covington, Ky., being elected vice-president. The executive committee consists of Frank O. Harris, chairman; Michael Gallagher, John H. Winder, S. B. Stewart, J. W. Dawson, G. H. Powell and Edw. Schonebaum.

Denver, Colo.—N. S. Walpole, owner of a quarter section of state land in Routt County has entered suit in the district court of Colorado to enjoin the state land board from granting to George Morrison a 5-yr. mineral lease upon his land with the right to mine for coal. The surface rights of the land are worth only $16,000, but since Walpole acquired the land a big vein of anthracite coal has been discovered estimated to be from 6 to 8 ft. thick. The state gets a royalty of 10c. on every ton of coal mined under the state laws and it is estimated that the school fund would receive about $550,000 if the clause which is included in every sale certificate that the state reserves all mineral rights is upheld in the courts. This is, of course, a test case. Last May an application was made by Morrison to the state board for mineral rights.

Benton, Ill.—A New York syndicate has employed several men to conclude the purchase of a large coal field in Southern Illinois. The deal will comprise from 300,000 to 400,000 acres of coal land in the counties of Saline, Hamilton, White, Gallatin and Franklin, and means an expenditure of $20,000,000 in those counties and probably the building of several railroads. The Louisville & Nashville R.R. Co. for the past few months has had engineers investigating the route for a railroad running from Evansville, Ind., by way of Ridgway and Equality, Ill., through Horseshoe Gap, tapping the coal and mineral belt of Hardin and Pope counties and connecting with the bridge that is now being constructed at Metropolis. The opening of this great field will necessitate the building of many other railroads to handle the large output which will be exported by a New York company.

Coal Trade Reviews

General Review

Anthracite trade even better than anticipated. Heavy movement of bituminous on contracts. Vessel shortage and improved local conditions cause slump in exports. Lake markets strong. Middle West unusually brisk.

Anthracite—Mine operations are now on a full time basis, and the market has stiffened up, probably even beyond expectations of the more conservative members of the trade. The car and labor supply are slowly becoming the controlling factors; shortage of special kinds of equipment, particularly for shipment to the West, is causing anxiety as regards the future. Concessions on the regular circulars are confined to unusual situations where it is necessary to move tonnage, and this in spite of the fact that there is a well defined effort noted in many directions to establish new high selling records. Unsold coal at tidewater is practically all cleaned up, and there is an excellent movement in the coastwise trade. Lake shipments are only fair.

Bituminous—A progressive improvement still characterizes the soft-coal trade, though the increased demand is confined essentially to extra requisitions on contracts. Forehanded consumers are now beginning to accumulate all the surpluses of the high-grade fuels they can carry, though prices generally have not responded to the improved tone, with a possible exception of a greater firmness. Manufacturing demand is steadily expanding, and even the more conservative members of the trade are notably optimistic. Car shortages are becoming more frequent, and this is causing much concern over the outlook for a month or two later; an encouraging aspect of the transportation problem is the effort being made to rush new equipment into service with the utmost dispatch.

Exports—Foreign shipments have fallen off at a pace equalled only by the recent spectacular increase. The accumulation at exporting piers is substantially above normal, and unless the balance of the month is characterized by an unexpected and notable increase, the October record will show up poor. The acute shortage in vessel tonnage is the principal cause of the decline, though the improvement in the local market and the exacting conditions defined by foreign buyers are also contributing factors. Vessel rates are not so high as last week but tonnage offering is eagerly mapped up to cover numerous orders.

Lake Markets—Demand from the steel industry, consumption in which has been up to the maximum capacity for the past several weeks, has taken another spurt due to stocking operations against possible future emergencies. It is a significant fact that the customary depression that characterizes the approaching close of Lake navigation, is entirely absent. The car shortage is steadily developing to greater proportions and is having a notable tendency to stiffen prices, conservative buyers coming into the market for surplus tonnages. Confiscation of coal by the Pennsylvania R.R. is also an important development of the week. Retailers stocks are only fair as a result of the light buying through the summer, and the cooler weather, with the consequent rush of orders from domestic consumers, has resulted in greater buying from the mines. The Southern market is substantially better than for some time, particularly as regards the movement on contract but there is still considerable room for improvement.

Middle West—The domestic trade is unusually brisk, steam business has improved, rush orders are more frequent, and there is evidence of the demand outstripping the production. Receipts at the upper lake docks are larger than last week, and shipments to interior points are substantially greater than during this time last year. Restrictions governing the use of coal cars are becoming more frequent. Railroads continue buying actively and production is at a relatively high level. Evidence of the better conditions prevailing is seen in the firmer attitude retailers are taking as regards credits. Some producers are already falling behind on contracts.

A Year Ago—Anthracite trade slowing up due to the warm weather, and concessions on the circular are freely offered. Further restrictions and cancellations are the features of bituminous. Practically no spot demand.

BUSINESS OPINIONS

Bradstreet—Trade expands at a speedier pace, and reports, especially from the eastern half of the country, are more satisfactory than for three years past. Activity in industries, many of which are sold far ahead, is accompanied by stiffer commodity prices, broader distribution by jobbers, good sales by retail dealers, enlarged road orders, increased railway traffic, improved commercial demand for money, plethoric supplies of funds, largely increased bank clearings, better collections and reports that many houses have increased their traveling forces. Stocks of staple wearing apparel at practically all points are light, the result of long-practiced conservative buying, and the uplift in trade seems to have developed a rush to cover requirements.

Dun—With cross currents diminishing in force, the tide of business is rising at an accelerated pace and an era of widespread activity is in prospect. Usually during a transition period gains are recorded slowly, but strictly mercantile conditions have passed the stage where progress is difficult of discernment, and of late industrial expansion has been phenomenally rapid. Reports from nearly all sections of the country tell of the unchecked growth of new enterprise, which, while manifest in varying degrees in different lines and localities, is everywhere stimulated by the exceptional strength of the fundamental situation. Assurance of agricultural success, together with almost unlimited financial resources, has given the commercial world the confidence essential to the development of national prosperity.

Marshall Field & Co.—Current wholesale distribution of dry goods shows considerable increase over the corresponding periods of the past two years. Buyers continue to come to market in much larger numbers. Collections are about normal. The cotton market is strong with continued advances and the trade in domestic cotton cloths is fairly active. The raw silk market has also shown considerable advance during the week anl still has a strong upward tendency. Finishers of cotton and silk goods have advanced their prices considerably the last few days.

Boston News Bureau—The general situation is assuming a more stable position. There is less sensational speculation and more legitimate operation. The credit departments of almost every bank say that their reports from general trade are highly encouraging. There is more activity in every line of trade and this is beginning to apply to luxuries as well as to necessities. But with all this, money is accumulating. Domestic business has not reached that stage as yet where credit is needed, and interests devoting their time to war business receive 25% of the amount involved when they take the order. Gold continues to dribble this way all the time to pay for war supplies, and this will continue.

Southern Lumberman—Advances in quotations on yellow pine are being made with such frequency by most of the larger mills that it has become increasingly difficult during the past week to ascertain the latest prevailing prices. In fact, the market is subject to spottiness, due to these advances, and the prices secured for any item are determined largely by the stock which a mill has on hand and the promptness with which it is able to make delivery. Reports of greater volume of business in hardwoods and at somewhat better prices are received this week. Not only is there increase in the business of the current week, but inquiries are decidedly more numerous, and though in most cases single orders are for small lots as compared to the character of business in normal times, they are being received with sufficient steadiness to accumulate a far more satisfactory aggregate than at any previous time in the past eighteen months. While the market has during that time been subject to numerous fluctuations due to the changing aspect of international affairs, to unforeseen increases or decreases in demand for certain woods, the regularity with which the present business is being secured is proving most gratifying to manufacturers and dealers alike.

ATLANTIC SEABOARD

BOSTON

Better demand on contracts but no improved spot market as yet. Some contracts already closed for 1916. Georges Creek steady, but Pennsylvania grades show an upward trend. Water freights unchanged. Anthracite trade satisfactory.

Bituminous—While the Pocahontas and New River situation shows a distinct improvement this week at Hampton Roads the extra demand from this market has been confined to contracts. Several large textile mills have resumed full time and coal receipts are perceptibly larger. There is a good deal of talk about car shortage and its effect a month or two hence, but so far practically no spot business has developed. There is so much coal offering that buyers are not much impressed as yet by any prediction of scarcity.

Prices for inland delivery continue fairly strong considering the light demand. On the strength of recent efforts to place coal for the year beginning next April an amount of contract business has already been closed, but in almost every case with the merchant or agency having the business this current year. The price is understood to be a "sliding" one, up or down from $2.85 f.o.b. Hampton Roads according as the market turns. In other words, those who place contracts now are simply availing themselves of a very low charge for putting the coal on cars at Boston piers.

Georges Creek is still in ample supply at the loading ports, but far-sighted patrons of this grade are taking on what they can store in anticipation of shortages later. Usually this coal is the very first to feel a pinch. Prices so far are unchanged, and shipments are coming forward with usual regularity.

In the Pennsylvania grades there has been somewhat of a spurt the past week, particularly f.o.b. Philadelphia. Prices have hardened generally and on some of the favored coals there have been advances of 5@10c., that is, for shipment to New England. Some of the agencies are quite bullish in tone, attributing much to a shortage of labor in all the regions along with a shortage of cars and the possible suspension next April. New England has not as yet responded to this opinion and probably will not to any degree until Hampton Roads coals begin to advance in price, should that be the case.

Water Freights are unchanged this week from Hampton Roads, 80@85c. being the basis to Boston on boats of 3,000 tons upward. For New York loading for Fall River and New Bedford the current rate is firm at 50c., an advance of 5c. over a week ago.

Anthracite trade is brisking at wholesale. "Indian summer" is having its effect on retail demand, but good business is just ahead. Shippers with supplies of broken and the steam sizes have no difficulty making sales. The hard-coal situation all along the line is in wholesome shape probably for the balance of the season.

Bituminous quotations, f.o.b. loading ports at points designated, are about as follows per gross ton:

	Philadelphia	New York	Baltimore	F.o.b. Mine
Clearfields	$2.25@2.75	$2.55@3.00	.....	$0.95@1.50
Cambrias and Somersets	2.45@2.95	2.70@3.20	.....	1.20@1.65
Georges Creek	2.92@3.02	3.22@3.32	$2.85@2.95	1.67@1.77

Pocahontas and New River prices, on cars Boston, are $3.55@3.73; Providence, $3.50@3.68, and f.o.b. loading port at Hampton Roads, $2.80@2.85.

NEW YORK

Movement on contracts heavy. Car and labor supply short. Exports decline. Concessions on anthracite practically eliminated. Mines on full-time schedules.

Anthracite—Trade during the week has shown further strength. Sufficient orders are in hand to keep operations going at full time. Notwithstanding, what is considered normal output is not easily obtained due to the shortage of labor. While demand has grown, labor supply has decreased due to the exodus of many foreign miners to their native countries and to take better paying positions with many of the steel and munition plants that are in a position to offer fancy wages. The car supply has also been short in some instances. Some of the companies that ship coal all-rail West at this season of the year are hindered at this time because of the short supply of box cars. Lake demand is good and these shipments are being made in the ordinary open coal cars.

Concessions in prices on domestic sizes are now rare and do not amount to more than 10 to 20c. a ton, as against 40 to 50c. during the dull summer season. Moreover, the cuts do not affect all sizes as was formerly the case. Now individuals are exacting premiums of 10c. a ton in some instances where coal is badly needed and buyers urge prompt shipments. Steam sizes continue very active, with supply decreasing for spot market needs.

	Lower Ports		Upper Ports	
	Circular	Individual	Circular	Individual
Broken	$5 05		$5.10	
Egg	5 30	$5 20@5.30	5.35	$5.25@5.35
Stove	5.30	5 20@5.30	5.35	5.25@5.35
Chestnut	5.55	5 30@5.55	5.60	5.40@5.60
Pea	3.50	3 25@3.50	3.55	3.50@3.55
Buckwheat	2.75	2 25@2.75	2.80	2.25@2.80
Rice	2.25	1.85@2.25	2.30	2.00@2.30
Barley	1.75	1.50@1.75	1.80	1.75@1.80

Bituminous—Contract requirements of bituminous are very heavy. The coke plants are calling for more coal than at any time in recent years, while many of the large manufacturing plants, some of which are now running day and night on war orders, are large consumers. Many small plants are coming into the market for fuel, and in the aggregate the demand is larger than it has been in many months. Export business is falling off because steamers are scarce, while bunker demand is improved because of the heavy movement of cargoes through all of the Atlantic ports.

Car supply was very bad last week on both Baltimore & Ohio and Pennsylvania lines. While there was a fair supply on Monday at many of the Pennsylvania mines, operators did not expect the supply to hold up for more than two or three days. Complaint is heard that some of the roads are not moving coal promptly when it is loaded; this is due to the heavy tax on motive power brought about by the heavy movement of all kinds of war munitions and the crops to the Eastern seaports. Slack has advanced in all regions.

Current quotations f.o.b. New York tidewater per gross ton are on the following basis:

	South Amboy	Port Reading	St. George	Mine Price
Georges Creek Big Vein	$3.20@3.30	$3.20@3.30	$3.20@3.30	$1.75@1.85
Georges Creek Tyson	2.95@3.00	2.95@3.00	2.95@3.00	1.40@1.45
Clearfield:				
Medium	2.65@2.80	2.65@2.80	.....	1.10@1.25
Ordinary	2.65@2.70	2.65@2.70	.....	1.10@1.15
Broad Top Mountain	.....	.....	.....	1.10@1.45
Cambria County:				
South Forks	2.90@3.05	.....	.....	1.35@1.50
Nanty Glo	2.80@2.85	.....	.....	1.25@1.30
Barnesboro	2.65@2.70	.....	.....	1.10@1.15
Somerset County:				
Quemahoning	.....	2.80@2.90	2.80@2.90	1.25@1.35
Medium	2.65@2.70	2.65@2.70	2.65@2.70	1.10@1.15
Latrobe	2.55@2.65	.....	.....	1.00@1.10
Greensburg	2.85@2.90	.....	.....	1.20@1.25
Westmoreland	3.20@3.30	.....	.....	1.40@1.50
West Virginia Fairmont ¾		2.70@2.80	2.70@2.80	.90@1.10
Fairmont mine-run		2.60@2.70	2.60@2.70	.80@ .90
Steam		2.55@2.60	2.55@2.60	1.00@1.05
Western Maryland		2.35@2.40	2.35@2.40	.85@ .90

PHILADELPHIA

Anthracite has good week with large orders. Car supply interferes. Stove leads as usual with egg fair and nut very weak. Pea strong at $2 and tax and buckwheat in good demand. Bituminous trade good. Railroads try to relieve car shortage with new equipment. Export quiet.

Anthracite—It is gratifying to record another active week. While the activity is apparent in the city trade, it is particularly true of the extensive suburban districts where shipments have been quite up to, if not beyond expectations. While the dealers are criticizing each other for not maintaining the prices, they are only following the example of the shipper for the past six months. Even now cheap coal is coming into the market, but probably in egg and chestnut sizes only. However, this causes no particular worry as there is always some coal sold off for some reason.

With the increase in business this week the car supply trouble has been greatly accentuated. Many companies are reporting extra large orders on the books and are prevented from making full shipments because of the lack of cars. This would not be so bad if there were any prospects of an early relief, but the general impression instead is that the situation will be worse as the season progresses. But even at that a number of companies are already claiming records for October.

Stove coal has been scarce among some shippers and free with none. Chestnut improves slowly, in fact, so very little that by some it is considered almost hopeless for some months to come. Egg coal is still dragging and causing the individuals, especially, some annoyance to get it off their hands without car service. Pea coal is strong at $2 and tax and some very large sales are recorded this week at that price, while a number of the companies are experiencing trouble to fill all orders. The price may advance, but as yet there has been no real sign of it.

Of the steam sizes buckwheat continues in fair demand, with rice just about the opposite. However, there is considerable storing of both sizes going on in the city at this time. Collections are in good shape; the large companies especially refuse to complain and are greatly pleased with the improvement shown the past few weeks. Good tidewater shipments of anthracite have again gone forward this week.

The circular prices per gross ton for line and Port Richmond shipments, but which do not include the state tax, are as follows:

	Line	Tide		Line	Tide
Broken	$3.50	$4.75	Pea	$2.50	$3.25
Egg	3.75	5.00	Buckwheat	1.25	2.25
Stove	4.00	5.00	Rice	.85	1.75
Chestnut	4.15	5.25	Barley	.50	1.50

Bituminous—A number of large orders have been placed the past week and there does not seem any doubt now that the long expected boost is really here. The export trade is slowing down, as will be noted by the few charters that have been recorded lately. Since the domestic business picked up many shippers have ceased in their efforts to secure foreign orders, although representatives from various governments are in the city making inquiry almost daily. However, very little new business is being placed because of unusual conditions applying to this trade which the American shipper does not seem inclined to meet in the face of good business at home. The prices last week in the local market remained practically on an even keel and the following represents a fair average:

Georges Creek Big Vein	$1.70@1.80	Fairmont gas, ¾	$1.25@1.35
South Fork Miller Vein	1.55@1.65	Fairmont gas, mine-run	1.10@1.20
Clearfield (ordinary)	1.15@1.25	Fairmont gas, slack	.75@ .85
Somerset (ordinary)	1.10@1.20	Fairmont lump, ordinary	1.05@1.15
West Va. Freeport	.95@1.05	Fairmont mine-run	.95@1.00
		Fairmont slack	.70@ .80

BALTIMORE, MD.

Labor and car shortage forcing many producers from the open market. Exporting below recent standards.

Labor shortage is restricting productions and car shortage is also interfering with shipments. With the demand growing steadily more coal men are forced to withdraw from the open market. Not even urgent contracts are being taken care of as desired. Export trade has fallen below recent standards. Last week the total shipment on foreign account was but 20,234 tons.

Anthracite men would be content if they too could get through coal as desired. Less embarrassment is felt, however, than with the bituminous trade, due to liberal yard supplies on hand.

The bituminous market is gradually stiffening. Car shortage was again a very apparent factor. Prices were firm at the following figures:

	Mines	Balt.*		Mines	Balt.*
Geo. Crk. Big Vein	$1.75	$2.93	Fairmont		
Geo. Crk. Tyson	1.40	2.58	Ordinary mine run	$0.90	$2.28
Clearfield	1.25	2.43@2.48	Ordinary ¾	.95@1.00	2.43
South Fork	1.40@1.45	2.63	Ordinary slack	.75@ .80	2.08
Latrobe	1.05	2.13	Low sulphur mine-run	1.15@1.20	2.53
Somerset (best)	1.35	2.53	Low sulphur ¾	1.25@1.30	2.68
Somerset (good)	1.20	2.38	Low sulphur slack	.80	2.18
Quemahoning	1.35	2.48@2.53			
Freeport	.95@1.00	2.03@2.08			
Miller Vein	1.15@1.25	2.28@2.33			

* F. o. b., outside Capes.

HAMPTON ROADS

Shipments for week light. Little demand for coal for prompt movement. October tonnage showing considerable falling off.

Dumpings over the various piers at Hampton Roads for the past week have been somewhat light as compared with a few weeks ago. The movement to Italian ports has fallen off somewhat although there have been several cargoes to that port. The largest cargo of the week for an Italian port was 9,000 tons which went to Genoa; other shipments went to Torre Annunziata, Genoa and one cargo to Gibraltar for orders for an Italian port.

The government took a small amount of coal by collier during the week. The number of bunker vessels coming in was light. The Norwegian steamer "Roald Amundsen" took about 5,200 tons of coal for a six months' whaling trip South this being the largest quantity of bunkers loaded into any one vessel at this port for some time.

The accumulation of coal on the railroad yards is rather excessive although some shippers are short on particular grades. There is a fair amount of vessel tonnage about due which will cut well into the accumulation now on hand but unless the demand improves and some spot sales are made for immediate movement the dumpings for the month of October will be considerably less than was anticipated.

Railroad Tonnages—Dumpings over the local piers for the past five weeks compare as follows:

	Week Ending				
Railroad	Sept. 18	Sept. 27	Oct. 2	Oct. 9	Oct. 16
Norfolk & Western	182,047	163,400	131,055	140,934	.....
Chesapeake & Ohio	87,686	91,341	72,996	93,344	66,361
Virginian	59,597	79,176	59,997	65,150	54,964
Totals	329,330	333,917	264,048	299,428	.....

Ocean Charters, Clearances and Freights

VESSEL CLEARANCES

The following steamers have cleared from various ports, during the week ended Oct. 15:

NORFOLK

Vessel	Destination	Tons
Achilles[1]	Cristobal	12,022
Bellatrix[2]	Havana	3,228
Muskegon[2]	Blanca	4,696
Gorredijk[3]	Antofagasta	6,679
Venus[4]	Gib	5,510
Genesee[5]	Montevideo	3,811
August[6]	Genoa	9,000
Luzon[6]	Annunziata	5,300
Lady Plymouth[2]	Italy	5,662
W. D. Noyes[8]	Brazil	5,506
G. Hubbard[7]	Georgetown	2,400

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Navarre[9]	Georgetown	3,100
Thelma[9]	Cuba	1,850
Nolismen[10]	Genoa	7,417
Tancred[11]	Cardenas	4,600
Francis[11]	Manaos	1,775
Thorsa[12]		1,500

PHILADELPHIA

Sif	Ft. de France	
Trym	Cienfuegos	1,138
F. C. Bowen	Calias	892
Orkild	Cuba	1,622
Monitor[13]	Providence	
Enterprise[13]	Boston	
Rutherford[13]	Lynn	
Lincoln[13]	Cambridge	
Kohinoor[13]	Brookline	
Phoenix[13]	Cambridge	
Oak Hill[13]	Portsmouth	
Hammond[13]	Gloucester	
Oley[13]	Searsport	
Spring[13]	Bangor	
Mahanoy[13]	S. Portland	
Wiconisco[13]	Newburyport	

PHILADELPHIA—Continued

Vessel	Destination	Tons
Robesonia[13]	Boston	
Beechwood[13]	Brookline	
Eagle Hill[13]	Milton	
Saucon[13]	Ft. Warren	
Brookside[13]	Brookline	
Paxinos[13]	Everett	
Bast[13]	Camden	
Pocopson[13]	Hallowell	
Skippack[13]	Brookline	
Pickering[13]	Randolph	
Molino[13]	Portland	
Bear Ridge[13]	Portland	
Irwin[14]	Providence	
F. W. Munn[14]	Boston	
Powell[14]	Boston	
Augusta	Camden, Me.	875
Barry[13]	Com. Point	
Herndon[13]	East Boston	
Cocalcico[13]	Boston	
Draper[13]	Dorchester	
Indian Ridge[13]	Bangor	
Yardley	Bangor	
Conewago[13]	Portsmouth	
Langhorne[13]	Portland	
Kimberton	Portland	
Berwindmoor[9]	Havana	
Ephrata[13]	Lynn	
Silver Brook[13]	Boston	

BALTIMORE

Teviotdale	Italy	4,652
Biemiller	Guatamala	1,528
Petritzis	Italy	5,246
Adriatico	Spain	3,107
Luigi	Italy	4,700
Davenport	Cuba	1,001

[1] W. C. Atwater. [2] New River Coal Co. [3] Baker Whiteley. [4] Flat Top Fuel Co. [5] C. G. Blake Co. [6] Pocahontas Fuel Co. [7] Castner, Curran & Bullitt. [8] Smokeless Fuel Co. [9] Berwind White. [10] C. H. Sprague. [11] Cinn. & Ohio Coal and Coke Co. [12] W. Va. Coal Co. [13] Phila. & Reading C. & I. Co. [14] Sterling Coal Co.

OCEAN CHARTERS

The following charters have been reported from various sources during the past week:

PHILADELPHIA

Vessel	To	Tons	Rate
W. E. Downes	Fort-de-France	639	
Wilhelmina	Houston, Tex.	1,069	
E. W. Hinkley	Guayanilla	1,200	3.00
Eagle Wing	Mayport	1,900	
Pendleton	Surinam		

BALTIMORE

G. Hawley	Galveston	1,699	
J. T. Maxwell	Surinam	461	
Plymouth	Mediterranean	7,000	
G. E. Warren	Galveston		

BALTIMORE—Continued

Vessel	Destination	Tons	Rate
S. del Mare	Italy		
L. L. Baxter	Cienfuegos		
R. B. Cobb	Martinique	530	
A. B. Phillips	Martinique	451	

VIRGINIA

Genesee	Buenos Aires	1,821	
Hesperos[1]	River Plate	2,722	8.15
D. Palmer	Italy	2,315	10.00
Fauna	Trinidad	728	

[1] 500 tons per day discharge.

OCEAN FREIGHTS

Very few steamers are offering for export coal, as owners can secure time charters for general cargo to same destinations at rates higher than coal shippers can afford to pay. When an occasional boat is offered for coal she is immediately accepted on one of the numerous coal orders in the market. It was reported a few days ago that London parties were offering $9.60 on coals from United States to Lower Plate ports, but we have been unable to ascertain whether or not this report is correct. We understand that some of the Plate consignees have purchased African coal to cover orders they originally intended shipping from here. We would quote freight rates on coal by steamer as follows:

To	Rate	To	Rate
Havana	$2.50@2.75	Bermuda	$3.00@3.25
Cardenas or Sagua	2.75@3.25	Vera Cruz	4.75@5.00
Cienfuegos	3.00@3.50	Tampico	4.75@5.00
Port au Spain, Trinidad	3.50@3.75	Rio	9.12
St. Lucia	3.50@3.75	Santos	9.12
St. Thomas	3.25@3.50	Montevideo	8.88@9.60
Barbados	3.50@3.75	Buenos Aires or La Plata	9.12@9.60
Kingston	3.00@3.25	Rosario	9.36@10.08
Curacao	3.25@3.50	West Coast of Italy	14.40
Santiago	3.25@3.50	Barcelona	12.00@13.20
Guantanamo	3.25@3.50	Valparaiso or Callao	7.50
Demerara	5.50@6.00	Marseilles	13.20

* Consignees paying dockage dues. ** Spanish dues for account. † Quotations on Plate coal by British steamers; neutral steamers are more difficult to obtain and the rates are always higher.

W. W. Battie & Co.'s Coal Trade Freight Report.

LAKE MARKETS

PITTSBURGH

Domestic and line demand increased, making market slightly firmer despite impending end of Lake shipping. Car shortages more frequent with serious difficulties feared. Labor growing scarcer.

Conditions as to demand for coal are increasing at least rapidly enough to overcome the disturbance that usually develops as the Lake shipping season approaches its end. If it were not for this influence the coal market would probably be definitely advancing at the present time. Domestic demand is expanding with the season, though retail dealers are still buying chiefly from hand to mouth. Railroad consumption is increasing and some of the lines are now stocking considerable coal. The line demand generally is increasing.

The iron and steel industry, which apparently reached its possible maximum of coal consumption a few weeks ago, appears to be taking a little more for current consumption while it is likely that some stocking will be done in the near future, against expected difficulties in transportation in the bad weather. The steel industry can less afford to take any risks on fuel supply than at any time before when the steel market has been strong, as some of its products are selling at fancy prices and everything must be counted to insure maximum production every day.

Labor is growing scarcer with increased demand in so many quarters, but there is still some slack to be taken up by the men working fuller time. Car shortages are almost daily growing more in evidence and serious difficulties are anticipated before long. Thus far car shortages, while often reported, have hardly amounted to more than inconveniences.

Slack is up about 10c. a ton for prompt shipment, Youghiogheny gas usually commanding about 70c., and sometimes more, but Monongahela steam slack is available at about 10c. less. Mine-run and screened are not quotably higher but are firmer, particularly for free coal. We quote free coal: Slack, 60@70c.; nut and slack, 95c.@$1; nut, $1@1.05; mine-run, $1.05@1.10; ¾-in., $1.12@1.20; 1¼-in., $1.25; on contract to Apr. 1: Slack, 85@95c.; mine-run, $1.15; ¾-in., $1.25; 1¼-in., $1.35, per net ton at mine, Pittsburgh district.

BUFFALO

Wave of bituminous activity coming slowly from Pittsburgh. Prospect of good movement next month. Car shortage spreading. Prices stiff.

Bituminous—The activity is visibly increasing, but is not as great as in the Pittsburgh district; in fact, it is doubtful if this market will equal the Pittsburgh district. All prices are strong, however, and the car shortage alone would be enough to insure firmness. It is reported that some of the leading Pittsburgh companies have made a higher price for the Canadian market, but there does not appear to be any advance ordered for Buffalo. The Pennsylvania R.R. is reported to be confiscating coal right along and there is not much report of consignment coal on track. In fact, the mines have all they can do to get the cars they need and to ship them out in time.

There is not much new activity eastward in the state yet; when the boom began there was a surplus of coal there which had to be worked off. Canada is also quiet as yet; all reports from there agree that the country is taking a much slower pace since the war. It will be hard to shake off this lethargy.

Bituminous prices are more firm from week to week, the following quotations prevailing:

	Pittsburgh	Allegheny Valley	Penn. Smokeless
Lump	$2.65	$2.45	$2.55
Three-quarter	2.55	2.30	...
Mine-run	2.45	2.20	2.30
Slack	2.20	2.10	2.30

Prices are f.o.b. per short ton to Buffalo and Rochester points and per long ton east of Rochester.

Anthracite—There is a steady increase of activity and the retailers are getting back to business. In another month the local trade should be up to the average. A new situation in the through anthracite trade is developing by the scarcity of box cars. This district makes a great part of its shipments in box cars. If they become very short the trade will be badly affected and the grain movement will also be cut down. Quotations are: Grate, $5.65; egg and stove, $5.85; chestnut, $6.10; pea, $4.30; buckwheat, $3.25; rice, $2.75; barley, $2.50; screenings, $2.25, all per gross ton f.o.b. Buffalo, with 25c. additional for delivery on board vessel. Lake shipments of anthracite for the week were 108,500 tons, a fair amount.

COLUMBUS

Strength developing in all departments. Steam increasing rapidly and prices have advanced. Retail trade active.

There is an increased demand for steam grades, due to the general expansion in manufacturing. All branches of the iron and steel industry are active and consequently there is a much better demand. Railroads also continue taking quite a good tonnage.

The domestic trade is also active and strong. Dealers are now buying better as their customers are requesting quick deliveries. Some of the retailers in Columbus have been compelled to put on additional men. Retailers' stocks are only fair and they are forced to place orders for replenishment. Practically all of the domestic orders are accompanied by a request for immediate shipment. Retail prices remain strong with Pocahontas and West Virginia splints in good demand. There is also a good demand for White Ash and Red Ash and Hocking lump is moving well. The advance in the circular of 10c. per ton made during the past week have been well maintained. It is likely another increase will be made within a short time.

Lake trade is rather active although the close of the season is approaching. Several of the Ohio shippers have finished their Lake contracts while others are still rushing a large tonnage to the head of the Lakes. Chartering of boats is about over for the season. Congestion at the upper lake ports is not as marked as formerly.

Car shortage on the Chesapeake and Ohio is delaying shipments. Some shortage of cars is also reported on the Norfolk and Western but not as bad as on some other roads. Ohio roads are in fairly good shape as yet but a shortage is anticipated.

Anthracite trade is increasing rapidly and prices are well maintained in Columbus and Central Ohio territory. The coke market is also growing stronger as manufacturing increases.

Prices in Ohio fields per short ton, f.o.b. mines are as follows:

	Hocking	Pomeroy	Eastern Ohio	Kanawha
Re-screened lump	$1.60	$1.65		
Inch and a quarter	1.50	1.50	$1.35	$1.50
Three-quarter inch	1.35	1.40		1.35
Nut	1.25	1.30		1.25
Mine-run	1.15	1.20	1.05	1.10
Nut, pea and slack	.70	.75	.55	.60
Coarse slack	.60	.65	.45	.50

Mines have been working at about the following percentages of full capacity:

District	Week Ended Sept. 25	Oct. 2	Oct. 9	Oct. 16	District	Week Ended Sept. 25	Oct. 2	Oct. 9	Oct. 16
Hocking	50	50	50	55	Cambridge	45	45	50	60
Jackson	25	25	30	40	Massillon	45	45	55	60
Pomeroy	75	80	75	85	Eastern O.	75	80	80	85
Crooksville	40	40	45	50	Average	50	52	55	62

CLEVELAND

Car shortage restricting shipments, but prices remain unchanged. Heavy receipts over Sunday kept jobbers busy cleaning up, but the market well maintained under the pressure.

Four hundred cars came in over Sunday, shipments from the mines having come through without delay and very much bunched. Cars are not being furnished as fast as the mines could use them and shutdowns are the rule. Some mines have been closed down as much as three days a week. But there is a distinct tone of improvement. Some of the operators have withdrawn quotations for the time being on account of the car situation and others have added from 5 to 15c. to contract quotations.

The Lake trade is not shipping as heavily as it could if the coal could be obtained from the mines. The upper Lake locks are moving fairly good tonnages, and will go into the winter with enough soft coal to carry them through without any trouble. Anthracite shippers are sending an extra tonnage up the Lakes to be prepared for a suspension in the spring. The receipts of hard coal at Duluth-Superior are 80,000 tons ahead of last year, with soft coal receipts 1,200,000 tons behind last year and still falling off.

Jobbers are being quoted at the following prices f.o.b. Cleveland per short ton:

	Pocahontas	Youghiogheny	Fairmont	Berghoolz	Ohio No. 8
Freight rate	$1.45	$1.00	$1.15	$0.70	$0.90
Lump	3.70				
Lump, 6-in.				2.30	
Lump, 1½-in.		2.40		2.10	2.15
Lump, ¾-in.		2.30	2.05	2.00	1.95
Egg	3.70				
Egg, 6-in				1.90	
Mine run	2.80	2.15	1.95	1.85@1.90	1.85
Slack		1.75@1.80	1.85	1.65	1.70

DETROIT

Gradual broadening of market and improved sales of steam coal. Domestic market reacts as result of higher temperature. Anthracite business light. Lake shipments below normal.

Bituminous—More general buying and renewal of orders give a more satisfactory aspect to the market for steam coal. Reduction in the sales of domestic coal are reported in consequence of the warmer weather. Little trouble is encountered in the sale of consignment stock, and while the supply of lump and egg seems more than adequate, the fine coals move quickly.

Anthracite—A scarcity of stove size and difficulty in obtaining sufficient cars of the required kind are the chief features of interest in the hard coal trade.

Lake Trade—Lake shipments are being handled almost wholly by freighters engaged in the iron ore trade. Vessels of independent fleets have been drawn into the grain trade and owners are unwilling to sacrifice the time that would be required in handling coal. The movement from the mines is somewhat restricted by lack of cars.

CINCINNATI

The car situation continues bad, with only about 50% of requirements, and prices have stiffened materially. Demand seems to be improving.

With a large deficit in storage supplies to be made up within a limited space, a car shortage of grave proportions will make this difficult. The Chesapeake & Ohio and the Baltimore & Ohio seem to be the worst off so far, but it seems that all of the coal-carrying roads, excepting possibly the Louisville & Nashville lines serving the eastern Kentucky district, are short of cars. Operators are able to move only a fraction of their output, in some cases only about 20% of the required equipment being available. As a result the market has stiffened, the steam trade responding particularly well. Unless more cars return from the Northwest it seems that the shortage will increase rather than diminish. Undoubtedly any cold weather at this time would send prices soaring, and might even cause distress among domestic consumers.

LOUISVILLE

Colder weather and car shortages have stiffened up the market. Operators cautious about future commitments.

A general stiffening of the Kentucky coal market under the influence of the car shortage, and the approach of the cold weather, together with improved industrial conditions, is reported by the Louisville operators. Eastern Kentucky mines are losing from two to three days a week and are reduced to a 60% schedule because of inability to get cars. Demand is showing an improvement and the movement is brisker. Operators are somewhat indisposed to undertake contracts for deliveries after the first of the year, it being considered that a general advance in labor costs is almost certain.

Sales during the week past, long ton basis, f.o.b. mines, have been made around $1.25 and $1.30 in Western Kentucky and $1.75 to $2.10 Eastern Kentucky for block, while pea and slack in Western Kentucky is still slow and different grades of Eastern Kentucky nut and slack have ranged from 25 to 40c. for low grades and 50 to 60c. for the best grades.

BIRMINGHAM

Coal trade some better though not as good as could be expected.

The coal business, both on steam and domestic lump, is better than it was thirty days ago, but there is still room for improvement. Shipments on contracts are satisfactory, but new business seems rather quiet. Lump coal is moving fairly good. Due to the small cotton crop, the oil mills throughout the South will have a short run this season, which will materially affect the tonnage of steam coal usually consumed by that class of trade. It is estimated that very few mills will operate later than the latter part of December, whereas, the season usually runs through March.

COKE

CONNELLSVILLE

Additional furnace coke contracting. Spot experiences sharp advance, giving operators somewhat higher views as to contracts. Production and shipments at new record for year.

Pickands, Mather & Co. have contracted for coke for one Toledo stack for the first four months of next year and for their two stacks at Erie and West Middlesex respectively for six months, while they still have to buy for another Toledo stack for the first three months of next year, the total coke being about 45,000 tons a month. The purchases for Toledo are timed to fill up until the byproduct plant at that point is completed. The price paid on the business closed is understood to have been about $2.25. Total contracting on this movement now amounts to fully 175,000 tons a month, for various periods, with a third or a fourth of the business still to be closed.

Last Friday morning it developed that overnight spot and prompt furnace coke had become very scarce, and $2.25 was bid freely not only for spot but also for any shipment this week, without bringing out enough coke to meet requirements, and at least $2.25 is being bid this week. It is said the chief prompt requirement is to tide over the Republic Iron and Steel Co. until its second block of byproduct ovens is operating, early in November, but spot coke may be $2.50 before the week is out, and the scarcity is inclining operators to ask more money on contract. Demand for foundry coke is only fair. We quote: Spot and prompt furnace, $2.25@2.35; November-December, $2.25; first half, $2.35@2.50; year 1916, $2.25@2.35; foundry: Spot, $2.30@2.60; contract, $2.40@2.60, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Oct. 9 at 417,724 tons, an increase of 20,135 tons, and shipments at 418,082 tons, an increase of 22,839 tons. The figures make new records for the year, and reflect one of the largest increases for a week over the preceding.

Buffalo—There is a steady increase in activity from week to week despite some report of over-production. Jobbers differ considerably in their reports of prices, though most of them state that they have paid higher prices this week than last. Shortage of box cars for foundry coke is reported. Best 72-hr. Connellsville coke in this market is not below $4.40, with $3.45 for stock coke.

Chicago—The coke market shows further strength. An advance of from 10c. to 15c. has taken place on byproduct foundry coke, and domestic sizes have stiffened. It is reported that considerable Eastern foundry coke is now being bought for this territory. Prices per net ton f.o.b. cars Chicago are as follows: Byproduct foundry, $5@5.25; byproduct domestic, $4.85@4.95; Connellsville, $4.85@5; Wise County, $4.85@5; gas coke, $4@4.15.

Birmingham—On account of the additional furnaces being put into blast in this district, there is a ready market for furnace coke, both beehive and byproduct, with prices around $2.75 for beehive 48-hr. coke and $2.25 to $2.40 for byproduct. Foundry coke is not as active as furnace coke, though the price is holding up.

MIDDLE WESTERN

GENERAL REVIEW

Domestic market shows increased activity screenings and steam coals stronger. Anthracite in healthy demand.

The domestic trade continues at an unusually brisk rate due to the early cold weather. The steam trade has also improved. Current shipments of all grades are being quickly consumed, so that stocks are not accumulating, and there is evidence that the demand is rapidly outstripping the supply. Rush orders are frequent and it is clear that the Western coal trade is in a flourishing condition. Salesmen making the Western territory report that not more than one-fourth of the normal volume of retail business has been done thus far and this undoubtedly means a lively demand throughout the balance of the year. Retailers have restricted local credits, and many of them are only doing business on a cash basis. Screenings are stronger; heavy absorption by large consumers has been reported, and a large tonnage of free screenings has been eliminated from the market. Some of the Western roads have advised operators that system cars can only be used for loading company coal.

CHICAGO

Demand good, car shortages developing and price concessions eliminated. Eastern coals short and orders urgent. Kentucky grades strong.

Franklin and Williamson County coals are in good demand, especially domestic sizes. Car shortages have developed on several roads, though not serious as yet. Williamson County coals are stiffening and all price concessions have been eliminated. Saline County operators are sold ahead on screenings for some time to come.

Springfield lump is sold as rapidly as produced, and screenings have been firm.

Indiana domestic grades are strong, and prices will advance as soon as another cold snap arrives; the output of

these sizes is larger than it was this time a year ago. Retailers are maintaining full stocks. Railroads are ordering increased quantities but industrial consumption is still slow. Car shortages are reported here and there. Sullivan County screenings have eased off somewhat.

West Virginia smokeless shipments are scarce due to car shortages. Rush orders have been placed with the mines which cannot possibly be filled, and some of the dealers in the Chicago district are much alarmed over the outlook. Pennsylvania smokeless is stronger because of the lack of shipments from West Virginia. The splint market is in better shape.

Hocking domestic trade is lively, and retailers are buying in considerable volume. Much school coal is being covered. The demand for steam sizes is comparatively strong due to stocking by railroads and increased fuel requisitions from manufacturers. Circular prices are well maintained.

In the Kentucky field a better situation exists. Tracks have been cleared of surplus coals, and the outlook is more promising than for a long time.

Anthracite representatives in Chicago have been flooded with a rush of orders.

Quotations in the Chicago market are as follows:

	Williamson and Franklin Co.	Springfield	Sullivan	Clinton	Knox and Greene Cos.
Lump	$1.75	$1.65@1.75	$1.50@1.70	$1.40@1.60	$1.40@1.60
Steam lump	....	1.25@1.30	1.20@1.30	1.25@1.35	....
2½ and 3-in. lump	....	....	1.40@1.50	....	1.30@1.40
1¼-in. lump	....	....	1.25@1.30	1.25@1.30	....
Egg	1.65@1.75	1.50@1.65	1.10@1.20	1.10@1.25	1.15@1.25
Nut	....	1.60@1.65	1.00@1.10	.95@1.10	1.00@1.05
No. 1 washed	1.75	....	1.50@1.60	....	....
No. 2 washed	1.40@1.50	....	1.40	....	....
No. 1 nut	1.65@1.75	....	....	....	....
No. 2 nut	1.40@1.50	....	....	....	....
Mine-run	1.10@1.15	1.00@1.05	.85@ .90	1.00@1.05	.85@1.05
Screenings	.50@ .60	.40@ .50	40@ 60	55@ .65	.75@ .80

	Harrisburg & Saline Co.	E. Kentucky	Pocah. & W.Va.Smok'l.	Penna. Smokeless	Hocking
Lump	$1.60@1.75	$1.75@2.25	$2.25	$1.75@2.25	$1.60@1.75
1¼-in. lump	1.25@1.35	....	....	....	1.35
Egg	1.60@1.75	1.45@1.75	2.25	1.75@2.25	1.00@1.10
Nut	....	....	....	....	....
No. 1 nut	1.65@1.75	1.60	....	....	....
No. 2 nut	1.40	....	....	....	....
Mine-run	1.15	1.00@1.15	1.40	1.25@1.40	1.15@1.25
Screenings	60@ .65	75@ .90	..	....	.50@ .65

INDIANAPOLIS

Indiana mines keep up active operation, though lacking the stimulus of cold weather. More mines opened.

There have been no material changes in the trade largely because moderate weather still prevails. Production, however, keeps up to its recent level and the market loses nothing of its strength. Railroads continue active buying and there is improvement in the volume of coal taken by manufacturing industries. Some additional mines have been opened after the summer idleness. Retail yards continue busy and some of them complain that they cannot get Eastern coals fast enough for their requirements. Recent prices still prevail. Some operators say that while working conditions are much improved over those of September and preceding months they are still selling practically at the summer price level.

ST. LOUIS

Colder weather has stimulated domestic business and urgent orders are being received. Increased production of screenings softens the market on that size.

A touch of wintry weather has stimulated the lump and egg market. Domestic users, who as a rule are six weeks later with their orders than last year, are sending in urgent orders for coal, and retailers have placed rush orders. Williamson County egg advanced to $1.50. The increased working time at the mines has reduced the price of screenings. The mines are operating four and five days a week. Carterville lump is somewhat scarce, while egg and No. 1 nut are a little slow. Country business was better on standard. All domestic sizes were moving more freely. Lump increased 5c. all around. There is practically no change in the steam situation.

Quotations f.o.b. mines ranged on the following basis per short ton:

	Frk. Co.	Wmsn. Co.	Staunton	Standard
6-in. lump	$1.50@1.75	$1.50@1.75	$1.25@1.50	$1.15@1.25
2-in. lump	.....	.....	1.15@1.20	1.05@1.10
3x6 egg	1.35@1.75	1.50@1.65	.....	1.00
No. 1 nut	1.50@1.75	1.50@1.75	.....	.85
No. 2 nut	1.40@1.50	1.40@1.50	.....	.55@.65
No. 1 washed	.....	1.65	1.40@1.60	....
No. 2 washed	.....	1.25	1.10@1.25	....
No. 3 washed	.....	1.25	1.00@1.25	....
No. 4 washed	.....	1.20	1.05	....
No. 5 washed	.....	.60@.70	.50@.60	....
Screenings	.40@.50	.40@.50	.25@.30	.25@.30

Freight rates: From inner group of mines, St. Louis, 57½c.; East St. Louis, 37½c. From outer group, St. Louis, 72½c.; East St. Louis, 52½c.

DULUTH

Domestic buying brisk. Shipments show a steady and gradual increase. Bituminous arrivals less than last year.

Shipments to the country districts show a considerable increase over a year ago for this period, and with normal weather, shippers hope to see a still greater increase. With the cool weather now prevailing much interest is noted in the domestic sizes and inquiries are more frequent, but still colder weather will be necessary before any great activity can be looked for. Receipts are slightly larger than last week and the total for the season to Oct. 1 is: Anthracite 1,129,220 tons as compared with 1914 shipments of 1,070,800 tons and bituminous 4,750,145 as compared with 6,309,300 tons in 1914. Prices f.o.b. cars, Duluth, are as follows:

	Yough.	Splint	Hock.	Smokeless	Elkhorn
Lump	$3.40	$3.40	$3.40	$4.75	$3.75
Dock-run	3.10	3.10	3.05	3.25	3.25
Stove or nut	3.40	3.40	3.40	4.75	3.65
Screenings	2.40	2.40	2.25	2.75	2.40

Weather conditions have been favorable for the movement of a fair volume of anthracite to the retail trade. Dealers teams are in greater evidence on the streets than for some time past and the thrifty householder is laying away his supply of fuel for the winter. Dock companies quote f.o.b. cars per short ton as follows: Egg and stove, $6.85, nut, $7.10, pea, $5.55 and buckwheat, $5.55.

PRODUCTION AND TRANSPORTATION STATISTICS

SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for May and the preceding three months:

	May		June		July	
State	1914	1915	1914	1915	1914	1915
Missouri	165,394	161,575	185,731	166,885	177,093	188,816
Kansas	370,097	354,264	490,561	449,803	513,312	453,735
Arkansas	95,749	71,023	133,350	71,498	117,016	78,568
Oklahoma	241,180	173,821	273,692	201,126	234,648	204,993
Totals	872,421	760,683	1,083,334	889,312	1,042,069	926,312

NORFOLK & WESTERN RY.

The following is a statement of coal handled by the N. & W. Ry. during September and the past four months in short tons:

	June	July	August	September
Pocahontas Field	1,493,776	1,648,551	1,721,573	1,620,362
Tug River District	348,737	361,454	337,585	354,981
Thacker District	238,688	265,743	227,312	230,198
Kenova District	81,794	80,009	80,152	89,921
Clinch Valley District	155,689	146,911	151,804	144,234
Other N. & W. Territory	3,418	2,651	4,239	3,798
Total N. & W. Fields	2,322,102	2,505,319	2,522,665	2,443,494
Williamson & Pond Creek	75,573	86,949	89,785	87,152
All other railroads	282,790	262,177	348,124	324,913
Grand total	2,680,465	2,854,445	2,960,574	2,855,559

CHESAPEAKE & OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for August and the two months of the fiscal years 1914 and 1915, in short tons:

	August				Two Months			
Destination	1915	%	1914	%	1915	%	1914	%
Tidewater	504,491	22	339,395	16	988,980	23	601,455	15
East	198,045	9	194,321	9	352,663	8	380,934	10
West	1,378,070	62	1,438,781	69	2,611,330	61	2,656,962	68
Total	2,080,606		1,972,497		3,952,973		3,639,351	
From Connections								
Bituminous	156,019	7	131,720	6	338,308	8	265,217	7
Anthra. (local)	138	...	.....	...	138	...	.....	...
Anthracite	1,669	...	1,866	...	2,988	...	2,744	...
Total	2,238,432	100	2,106,083	100	4,294,407	100	3,907,312	100
Coke	25,010		21,181		46,970		46,214	

VIRGINIAN RAILWAY

Total shipments of coal over the Virginian Ry. for August amounted to 411,090 tons, which compares with 381,853 tons for the previous month and 361,906 tons for August of 1914.

I. C. C. RULINGS

I. C. C. No. 5905—Plymouth Coal Co. vs. Lehigh Valley R.R. Co.

1. Defendant has justified its refusal to continue to furnish storage bins at Perth Amboy, N. J., for the free storage of anthracite coal.

2. Defendant's demurrage regulations governing anthracite coal awaiting trans-shipment at tidewater at Perth Amboy found reasonable.

Coal Contracts Pending

The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.

✚Indicates contracts regarding which official information has been received.

Supplemental Notes

Under this heading additional or supplemental information regarding old contracts appears, together with the page number of the original notice.

✚**1372—Latrobe, Penn.**—All the bids on this contract (p. 446), which provides for furnishing the Derry Borough School Board with Jamison No. 1 grade mine-run coal, have been rejected and the coal bought in the open market at $1.10 per ton. Address Pres. J. D. Neely, Derry Borough School Bd., Latrobe, Penn.

1406—Ogden, Iowa—Four bids were submitted on this contract (p. 448), which provides for furnishing the best grade lump and mine-run coal to be delivered in carload lots at the local school buildings, but all were rejected, and the Board has divided the business among local dealers, paying $3.35 per ton delivered. It is stated that the Board will be glad to consider prices from concerns to buy direct from the mines. About 150 tons is involved. Address Pres. D. A. Good, Bd. of Edu., Independent School Dist., Ogden, Iowa.

1497—Cleveland, Ohio—Bids have been received on this contract (pp. 577, 616), which provides for furnishing approximately 7,500 tons for the Cleveland Pumping Station, as follows: Valley Camp Coal Co., $1.67½ on No. 8 and $1.77 for Acme Pennsylvania coal; Moreland Coal and Coke Co., $2.05 per ton on West Virginia coal. Prices are in both instances for slack coal delivered in Cleveland as required. The price of the Valley Camp Co. is regarded as extremely low considering the outlook. Address Comr. of Purchases and Supplies A. R. Callow, 511 City Hall, Cleveland, Ohio.

1541—Scranton, Penn.—The bids on this contract (p. 617), calling for a supply of coal to the schols in this city, resulted as follows:

	High School	District No. 1		
	Buckwheat	Stove	Nut	Pea
Standard Coal Co.	$2.50	$4.20	$4.40	$3.25
Carlton Coal Co.	2.70	4.25	4.40	3.50
Bull's Head Coal Co.	2.50	4.15	4.50	3.50

The James J. Kearney Coal Co. submitted flat prices for the delivery of coal in all districts as follows: Stove, $4.25; nut, $4.50; pea, $3.25; buckwheat for High School, $2.40. The award has not as yet been made. Address Secy. G. E. Haak, School Board, Administration Bldg., Scranton, Penn.

1510—New Orleans, La.—This contract (p. 577), which provides for furnishing the Louisiana Distilling Co. with approximately one car of steam coal per day, is now being closed. Address Purchasing Agent, Louisiana Distilling Co., 865 South Peter St., New Orleans, La.

1528—Memphis, Tenn.—Purchases on this contract (p. 616), which provides for furnishing the South Memphis Brick Co. with approximately 10,000 of No. 2 lump coal, will be made as required. Address Pur. Agt. John J. Bishop, South Memphis Brick Co., Madison St., Memphis, Tenn.

1545—Ocean City, N. J.—Bids have been received on this contract (p. 617), which provides for furnishing the Board of Education with its fuel requirements for the coming season, as follows: C. H. Shoemaker Lumber Co., nut, $7.35; pea, $5.60; Hedley & Adams, nut, $7.35; pea, $5.60. Address Secy. L. E. Smith, Bd. of Edu., Ocean City, N. J.

✚**1549—Trenton, N. J.**—Bids have been received on this contract (p. 617), which provides for furnishing and delivering approximately 3,500 tons of bituminous coal to the local Pumping Station and 300 tons to the Municipal Building, as follows: The James Oliphant Supply Co., Keystone stoker, $3.70; Hirsch Bros., bituminous, $3.85; the Tattersall Co., specified coal, $3.80; Thorne, Neal & Co., specified coal, $3.95. No award has yet been made. Address City Chemist A. Parobek, City Hall, Trenton, N. J.

New Business

1566—Cleveland, Ohio—The Cuyahoga County Board of Commissioners will receive sealed bids until 10 a.m., Nov. 3, for furnishing coal as may be required at the County buildings for the year beginning Dec. 21. About 30 tons of the best-grade Lackawanna egg coal will be required, 2,000 tons of Pittsburgh nut coal, and 100 tons of the best-grade bituminous lump. All bids must be accompanied by samples of not less than 25 lb. of coal it is proposed to furnish, and a certified check for $500 must be submitted with each bid. Address Clk. E. G. Krause, Cuyahoga County Comrs., Cleveland, Ohio.

1567—Hettinger, N. D.—The Adams County Board of Commissioners will receive bids until 10 a.m., Nov. 5, for furnishing lignite coal as may be required for heating the county building during the ensuing year. Bids should include cost of delivery in the bins as required. Address County Audr. Walter F. Kelley, Adams County Comrs., Hettinger, N. D.

1568—Bargaintown, N. J.—The Board of Education at this place received bids until 2 p.m., Oct. 21, for furnishing the schools at Bargaintown, Steelmanville, Scullville, and English Creek, with anthracite stove and nut coal as may be required during the ensuing year. Address Dist. Clk. William Hauenstein, Bd. of Edu., Bargaintown, N. J.

1569—Winner, S. D.—The County Government at this place will receive bids until 2 p.m., Oct. 28, for furnishing bituminous coal as may be required for use at the Court House during the coming winter. Address Audr. F. E. Wells, Winner, S. D.

1570—Goshen, Ind.—The Municipal Electric Light Plant at this place usually contracts for its annual fuel requirements during the latter part of November. About 3,500 tons of three-quarter lump coal is required and the customary price is approximately $2.60 per ton f.o.b. The business is done on competitive basis. Address City Clk. W. A. Brooks, Goshen, Ind.

1571—Ocean City, N. J.—The Department of Public Parks and Public Property at this place received bids until 1:30 p.m., Oct. 19, for furnishing coal as may be required at the City Hall during the ensuing year. Address Dir. George O. Adams, Dept. of Pub. Parks and Property, City Hall, Ocean City, N. J.

District No. 2			District No. 3			District No. 4		
Stove	Nut	Pea	Stove	Nut	Pea	Stove	Nut	Pea
$4.10	$4.35	$3.25	$4.20	$4.40	$3.25	$4.20	$4.50	$3.25
3.85	4.10	3.50	....	....	....	4.50	4.75	3.50
4.15	4.50	3.50	4.25	4.50	3.50	4.15	4.50	3.50

1572—Minot, N. D.—The Troy Laundry at this place received bids until 2 p.m., Oct. 15, for furnishing approximately 1,000 tons of lignite lump coal during the year beginning Nov. 1. All bids were to be f.o.b. cars at Minot. Address Purchasing Agent, Troy Laundry, Minot, N. D.

No. 1573—Philadelphia, Penn.—The City of Philadelphia is asking bids for additional supplies of coal on a deficiency contract (see also Contract 1516, pp. 577, 660), until the end of the present year as follows:

	Pea	Buck.	Bitu.
Belmont Pumping Station	6,900	2,300	.....
City Delivery	200	.....	.....
Mingo Creek Station	200	.....	.....
Belmont Filters	300	.....	.....
Queen Lane Filters	300	7,400[1]	.....
Spring Garden Pumping Station	100	.....	.....
Mt. Airy	100	.....	.....
Lardners Point Pumping Station	...	.....	17,000
Torresdale Filters	...	.....	8,500
Shawmut Pumping Station	...	.....	5,600
Georges Hill	...	400	.....
Roxborough Auxiliary	...	1,000	.....

[1]Pumping Station.

Bids will be opened at noon, Oct. 26. Proposal blanks may be had on application. Address, Director Herman Loeb, Department of Supplies, City Hall, Philadelphia.

1574—New Orleans, La.—The International Distillery Co., at this place, is in the market for their annual supply of coal involving approximately one car per day. Quotations should be made f.o.b. their switch. Address Pur. Agt. Kern, International Distillery Co., Pine and Ferdinand Sts., New Orleans, La.

✚**1575—Fountain Springs, Penn.**—The State Hospital for Injured Persons will receive bids until Nov. 2 for supplying the Institution with coal during the year beginning Dec. 31. Complete information may be had on application. Address Supt., Dr. J. C. Biddle, State Hospital for Injured Persons, Fountain Springs, Penn.

1576—New Orleans, La.—The Lane Cotton Mills will contract some time before Nov. 15 for approximately 50 cars of steam coal. Address Pur. Agt. R. Lecorgne, Lane Cotton Mills, 434 Cadiz St., New Orleans, La.

✚**1577—Minneapolis, Minn.**—The Glenn Lake Sanatorium Commission will receive bids until noon, Oct. 28, for furnishing approximately 1,000 tons of Pocahontas screenings. Deliveries are to be completed by Apr. 1, 1916, and all bids must be accompanied by a certified check for 5% of the amount bid. Specifications are on file at the office of the Secretary. Address Secy. Herbert O. Collins, Minneapolis City Hospital, Minneapolis, Minn.

✚**1578—Pittsburgh, Penn.**—Sealed bids will be received until noon, Nov. 4, for furnishing and delivering coal to the Western Penitentiary during the year beginning Dec. 1. Bituminous coal is required, and quotations should be made f.o.b. cars, Rockville Station, on the Pennsylvania R.R. A certified check for $200 will be required with all bids. Address Supt. John Francies, Bd. of Inspectors, Western Penitentiary, North Side, Pittsburgh, Penn.

1579—New Orleans, La.—The Cosmopolitan Hotel will contract some time before Nov. 15 for their annual fuel requirements involving about 120 tons per month. Quotations are to include cost of delivery. Address Mgr., Major Stewart, Cosmopolitan Hotel, 120 Bourbon St., New Orleans, La.

✚**1580—Fort Slocum, N. Y.**—Sealed bids were received until 9:30 a.m., Oct. 19, for furnishing and delivering coal in the bins or sheds at Fort Slocom as may be required by the steamer "General Barry" during the period beginning Nov. 1 of the current year, and ending June 30 next year. Complete information may be had on application. Address Capt. S. E. Smith, Quartermaster corps, U. S. Army, Fort Slocum, N. Y.

1581—New Orleans, La.—It is understood that the Leland Steamship Co. will contract some time in the near future for their annual requirements of coal involving approximately 50,000 tons of steam coal. Address Purchasing Agent, Leland Steamship Co., 1210 Hibernia Bank Bldg., New Orleans, La.

✚**1582—Erie, Penn.**—Bids will be received until noon, Nov. 1, for furnishing the outdoor poor with anthracite and bituminous coal for the year beginning Nov. 2, and also for furnishing the Directors of Poor with the best quality three-quarter screened lump coal for the Erie County Almshouse for the same perior. Specifications are on file. Address County Controller Joseph E. Leslie, Erie, Penn.

1583—New York—Bids will be received by the Department of Docks until noon, Oct. 27, for furnishing and delivering approximately 2,000 tons of No. 3 buckwheat coal for use in the Borough of Richmond. For bids and awards on previous contracts of this department, see contract Nos. 935 and 1068. Full particulars may be obtained on application. Address Comr. R. A. C. Smith, Pier "A," New York.

1584—New Orleans, La.—The William Henderson Sugar Refinery at this place will contract for their annual requirements of coal, involving approximately 50,000 tons, some time before the end of the current year. A good-grade steam coal is required, and quotations should be made f.o.b. their tracks in South Peters St. Address William Henderson, William Henderson Sugar Refinery, 749 South Peters St., New Orleans, La.

1585—Montclair, N. J.—The State Board of Education will receive bids until noon, Oct. 30, for furnishing approximately 600 tons of pea coal and 60 tons of Lackawanna stove coal. Prices are to include cost of delivery in the bins at the schools as may be required. Address Chn. Melvin A. Rice, Normal School Committee, State House, Trenton, N. J.

1586—Pee Dee, S. C.—The Pee Dee Brick and Tile Co. will contract some time during November for their annual requirements of coal, amounting to approximately 700 tons a month. The business usually goes to the Stonega Coal and Coke Co. at about $2.40 per ton. The Pee Dee Co. has a storage capacity for 500 tons and deliveries are made by A. C. L. R.R. Address Pur. Agt. Edward Cox, Pee Dee Brick and Tile Co., Main St., Pee Dee, S. C.

1587—Jeanette, Penn.—The Jeanette Borough School District will receive bids until 8 p.m., Oct. 21, for furnishing and delivering coal to the various school buildings as may be required during the ensuing year. Full particulars may be obtained on application. Address Secy. J. C. Rovensky, Jeanette Borough School Dist., Jeanette, Penn.

Contracts Awarded

Note—Successful bidders are noted in **bold face** type.

✚**1339—Cleveland, Ohio**—This contract (p. 410), which provides for furnishing approximately 4,500 tons of coal for the garbage reduction plant at this place, has been awarded to the **Morris-Poston Coal Co.** at $1.84 per ton. Address Dir. A. A. Benesch, Pub. Ser. Dept., 204 City Hall, Cleveland, Ohio.

✚**1341—Great Falls, Mont.**—This contract (p. 410), which provides for furnishing the schools of District No. 1 with coal during the ensuing year, has been awarded to the **Wilbur Transfer and Storage Co.** on the following basis: Mine run coal, f.o.b. and city school, $2.38 per ton; lump coal delivered at county schools $3.85 per ton; lump coal f.o.b. yard, $3 per ton; lump coal delivered at Franklin School on the west side, $3.50 per ton. Approximately 1,500 tons of coal are consumed per year. Address Clk. H. A. Cary, School Dist. No. 1, Great Falls, Mont.

1435—New Orleans, La.—This contract (p. 490), which provides for furnishing the Canal Bank and Trust Co. with approximately 150 tons of bituminous coal, has been awarded to the **W. G. Coyle Coal Co.,** the business being negotiated somewhat earlier this year than usual. Address Pur. Agt. E. L. Kiefer, Canal Bank and Trust Co., New Orleans, La.

✚**1437—Osage City, Kan.**—This contract (p. 390), which provides for furnishing the local Electric Light Plant, and other city departments, with coal during the period beginning Sept. 15 of the current year, and ending Mar. 15 of next year, has been awarded to **John A. Johnson** on Osage City shaft mine-run coal at $3.20 per ton. The Big Six Coal Co. bid $3.30 per ton for the same coal. Address City Clk. C. E. Johnson, Osage City, Kan.

✚**1448—Crosby, Minn.**—This contract (p. 490), which provides for furnishing the local Board of Education with approximately 300 tons of coal, has been awarded to the **Mahlum Lumber Co.** at $4.67 per ton. Address Clk. J. E. McCoy, Independent School Dist., Franklin School Bldg., Crosby, Minn.

✚**1454—Sharpsburg, Penn.**—This contract (p. 530), which provides for furnishing the local Board of Education with coal during the ensuing year, has been awarded to **John Ross,** at $2.10 per ton for ¾-in. lump coal. Address Secy. G. A. Speer, Bd. of Edu., Sharpsburg, Penn.

1456—Portsmouth, Ohio—This contract (p. 530), which provides for furnishing the County Infirmary with approximately 5000 bu of coal, has been awarded to the **Norfolk & Chesapeake Coal Co.,** at $1.65 per ton for mine-run coal f.o.b. Portsmouth. Address County Audr. Thos. C. Patterson, Portsmouth, Ohio.

1460—La Moure, N. D.—This contract (p. 530), which provides for furnishing La Moure County Commissioners with approximately 100 tons of coal has been awarded to the **Tanner Elevator Co.** at $6.23 per ton for Hocking Valley or Virginia splint coal. Address County Audr. O. C. Temple, La Moure, N. D.

✚**1467—Highmore, S. D.**—This contract (p. 531), which provides for furnishing the fuel requirements during the ensuing year to the County Court House, has been awarded to **M. E. Miller Co.** on Youghiogheny coal at $7.35 per ton. Address Audr. L. W. Carter, Hyde County, Highmore, S. D.

✚**1471—Fort Worth, Tex.**—This contract (p. 531), which provides for furnishing the Tarrant County Orphans Home with coal has been awarded to **Murphy & Anderson,** at $4.95 per ton. Address County Audr. J. A. Mulholland, Tarrant County, Fort Worth, Tex.

✚**1472—Alpena, Mich.**—This contract (p. 531), which provides for furnishing the local Board of Education with coal as may be required during the ensuing year, has been awarded to **M. N. Bedford & Co.** on Youghiogheny three-quarter lump at $3.40 per ton delivered. Address Secy. Alfred E. Ash, Alpena Bd. of Edu. Alpena, Mich.

1475—Cincinnati, Ohio—This contract (p. 531), which provides for furnishing the Hamilton County Infirmary at Carthage, with approximately 1,500 tons of Pocahontas or New River mine-run coal, has been awarded to the **Reliance Coal and Coke Co.,** at $2.44 per ton. Address Clk. Albert Reinhart, County Comr.'s Office, Cincinnati, Ohio.

1481—Mandan, N. D.—This contract (p. 576), which provides for furnishing the local Board of Education with approximately 200 tons of screened deep-mined lignite coal to be delivered at the various school houses, has been awarded to the **Mandan Transfer Co.** at $2.29 per ton. Address Clk. J. H. Noakes, Bd. of Edu., Mandan, N. D.

✚**1484—Sunbury, Penn.**—This contract (pp. 576, 616), which provides for furnishing the County Government with 250 tons of anthracite pea coal, has been awarded to the low bidder **George A. Nevin,** at $2.90 per ton. Address Controller Aaron Baker, Court House, Sunbury, Penn.